

# American Forestry

Vol. 22

MAY, 1916

No. 269



THE AMERICAN ELM



LONG  
LIFE  
FOR  
WOOD  
AT LOW  
COST

Showing tank and treatment of timber  
with Grade-One Creosote Oil



Showing application of Grade-One Creosote Oil by hand.



Will prevent decay of fence posts, base-  
ment plankings, sills, stringers, telegraph  
and telephone poles and exposed timber.

The *Barrett* Company

New York      Chicago      Philadelphia      Boston      St. Louis      Cleveland      Cincinnati      Pittsburgh  
Detroit      Birmingham      Kansas City      Minneapolis      Salt Lake City      Seattle      Peoria  
THE PATERSON MANUFACTURING COMPANY, Limited :      Montreal      Toronto      Winnipeg      Vancouver  
St. John, N. B.      Halifax, N. S.      Sydney, N. S.

# AMERICAN FORESTRY

## *The Magazine of the American Forestry Association*

PERCIVAL SHELDON RIDSDALE, Editor

### EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

May, 1916. Vol. 22

### CONTENTS

No. 269

The American Elm ( <i>Ulmus americana</i> )—Cover Picture.		
<b>The American Elm</b> —Identification and Characteristics—By Samuel B. Detwiler.....	259	
With eight illustrations.		
<b>Commercial Uses of the White Elm</b> .....	262	
With nine illustrations.		
<b>Magna Charta of China's Forestry Work</b> —By Dr. Joseph Bailie	268	
With seven illustrations.		
<b>The Bird Department</b> —The Return of the Birds—By A. A. Allen, Ph.D.....	273	
With six illustrations.		
<b>Blasting and Tree Planting</b> —By F. W. Wilson.....	276	
With one illustration.		
<b>Tree Bark as Human Food</b> —By Hu Maxwell.....	277	
With four illustrations.		
<b>George Washington Profile</b> .....	280	
With one illustration.		
<b>A Private Forestry Undertaking</b> —By A. F. Hawes.....	281	
With four illustrations.		
<b>The Conifer's Curse</b> —By R. E. Taft.....	283	
With three illustrations.		
<b>Huge Dome of Granite</b> —By Guy E. Mitchell.....	285	
With one illustration.		
<b>Fighting Gully Erosion</b> —By W. R. Mattoon.....	286	
With four illustrations.		
<b>The Greenheart of Commerce</b> —By C. D. Mell.....	288	
With six illustrations.		
<b>The Children's Department</b> —Fire in the Woods—By Bristow Adams.....	292	
With three illustrations.		
<b>Ornamental and Shade Trees</b> —The Tree Faker—By Hermann W. Merkel—J. J. Levison.....	294	
With three illustrations.		
<b>How to Build a Camp Fire</b> .....	298	
With two illustrations.		
<b>The Twin Beech Trees</b> .....	299	
With one illustration.		
<b>Wood Preserving Department</b> —By E. A. Sterling.....	300	
<b>Lumber Uses</b> —By Warren B. Bullock.....	301	
<b>Purpose of Arbor Day</b> .....	302	
<b>Plan for Tree Exhibit</b> .....	303	
<b>Editorial</b> — The Failure of Louisiana's Forestry Policy—And Its Remedy.....	304	
<b>Book Reviews</b> .....	306	
<b>Canadian Department</b> —By Ellwood Wilson.....	307	
Current Literature.....	307	

#### CHECK OFF BOOK DESIRED.

##### THE BIRD BOOK

By CHESTER A. REED, S.B.

1,500 Colored Illustrations of Birds, Eggs, Nests, etc. 700  
Birds in Natural Colors. Egg of each Bird in Natural Size.  
472 Pages, size 7 by 10; fine paper; heavy binding.

##### TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS

By Kirkegaard, formerly director Royal Botanical Gardens,  
Copenhagen, Denmark. Its 410 pages are brimful of valuable  
data. Has sixty beautiful full page sepia photographs; chapters  
on pruning, insect pests, etc., also an exhaustive planting list.

##### THE TREE GUIDE

By JULIA ELLEN ROGERS

265 Pages, Over 250 Illustrations

A compact pocket manual of trees to aid the student and the  
beginner to distinguish and identify the trees and to tell why they  
are recognized. Every lover of trees should have this book.

##### Trees Every Child Should Know

By JULIA ELLEN ROGERS

263 Pages, 47 Full Page Illustrations.

All parents wish their children to know about trees, their uses  
and how to identify them. This book will be found interesting  
and helpful not only to the child but to the adult.

#### BOOKS FREE TO MEMBERS

To any member of the American Forestry Association securing ONE  
NEW SUBSCRIBING MEMBER any one of the books to the left will be  
sent free of charge.

#### FILL OUT THIS BLANK

AMERICAN FORESTRY ASSOCIATION, Washington, D. C.

Enclosed is \$3 for Subscribing Membership fee (\$2 of which is a subscription  
for one year for American Forestry Magazine).

Name.....

Street.....

City.....

#### SEND BOOK TO

Name.....

Street.....

City.....

AMERICAN FORESTRY is published monthly by the American Forestry Association. Subscription price, three dollars per year; single copies, twenty-five cents

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879



## *Lacey Files of International Timber Records at Your Service*

*The offices of James D. Lacey & Company contain a scientifically ordered body of international timberland information, records and reports which would be a revelation to you if you have never inspected them. Having taken 36 years in the gathering, it is by far the largest and most accessible resource of its kind in existence.*

*Naturally, as nearly everyone who contemplates the purchase or sale of timberlands turns to us sooner or later, our fund of information is being augmented from day to day.*

*The full benefits of this resource may be shared by you if you contemplate anything which has to do with the surest, safest and most profitable investment of today—timberlands, well purchased.*

*Send for our booklet, "Pointers."*



CHICAGO  
1750 McCormick Bldg.

SEATTLE  
1009 White Building

PORTRLAND, (ORE.)  
1310 Northwestern Bank Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# American Forestry

VOL. XXII

MAY, 1916

No. 269

## The American Elm

(*Ulmus americana*)

BY SAMUEL B. DETWILER.

"Wise with the lore of centuries,  
What tales, if there were tongues in trees,  
That giant elm could tell."

**O**F all our shade trees, the American elm is the most aristocratic; wherever it is seen it produces the impression of dignity and courtliness. Michaux, the great botanist, commended it as "the most magnificent vegetable of the temperate zone." It is fitting that beneath a noble elm, at Cambridge, Mass., Gen. Washington



AREA OF GROWTH OF AMERICAN ELM

took command of the Continental Army; it is equally in character that William Penn made his solemn compact with the Indians in the shade of a great elm at Shackamaxon, on the banks of the Delaware. Voltaire refers to this agreement as "the only treaty never sworn to and never broken." Although the Treaty Elm was destroyed by a storm more than a century ago and only a monument now marks the site, the tree has been immortalized in the famous painting by Benjamin West.

Before the days of the American Revolution American elms were selected for planting as symbols of liberty; the most famous Liberty Trees were in Boston, Providence, Newport and New York. The Liberty Elm at Providence, R. I., stood in Olney's Lane, and was dedicated to the "Sons of Liberty" on July 25, 1768, before a great gathering of people, in the following words: "We do, in the name and behalf of all true sons of liberty

in America, Great Britain, Ireland, Corsica, or wheresoever they may be dispersed throughout the world, dedicate this tree of liberty. May all our counsels and deliberations, under its venerable branches, be guided by wisdom and directed for the support and maintenance of that liberty which our forefathers sought out and found under the trees in the wilderness; may it long flourish, and may the sons of liberty often repair hither to confirm and strengthen each other. When they look toward this sacred elm may they be penetrated with a sense of their duty to themselves and their posterity, and may they, like the house of David, grow stronger, while their enemies, like the house of Saul, shall grow weaker and weaker.—Amen."

In England it was customary for the people to gather under an elm on the village green to debate public questions. Memories of home probably inspired the early settlers of New England to plant elms in their dooryards and on the village greens, and today these elms and



LEAF BUDS AND FLOWERS OF THE AMERICAN ELM

The leaves are from 4 to 6 inches long, thick, rough, unequally based, acute at the apex and doubly toothed on the margin. The flowers occur in three or four flowered clusters on drooping stalks about one inch long; the buds are reddish-brown, the leaf buds are smaller than the flower buds and are located toward the end of the twig. The flower buds are larger and are located along side of twig.

their successors have become the most valued ornamental feature of the New England landscape. An invading army of pests threaten the existence of these cherished trees, but a determined fight is being made to save them.

The American elm is a tree that well deserves first place in the list of our ornamental trees. It is even more beautiful in winter than summer, unless, perchance, some misguided individual has attempted to improve on nature



THE PALM LEAF FORM OF ELM

The one-sided character of this tree is not well seen in a photograph, but the name describes it well; it is just like a huge palm leaf fan. This variety of the elm must be seen in the field to be thoroughly appreciated.

by pruning it and has thus marred its natural symmetry of form. When the elm grows all its life in the open it has a broad, rounded top, occasionally shaped like that of an oak, but with more gracefully extended limbs. One of the most common and striking forms has a vase-shaped top. The trunk rises, a single shaft, for many feet above the ground and then separates into several large branches, which sweep upward and outward into wide arches and terminate in masses of slender drooping twigs. Very rarely the top is umbrella-shaped, the trunk remaining entire nearly to the full height of the tree, and then abruptly branching into a wide arch, fringed by long drooping branchlets. With a shorter trunk an elm of this type with its pendant sprays sweeping nearly to the ground rivals the weeping willow in grace. Sometimes the branches are stiffer, the long, straight trunk is feathered with short branches and the top resembles a beautiful plume. If it is desirable to plant an American elm that will develop any particular form of top, elm seedlings should be grafted with scions from a tree of the type desired.

The American elm is not only picturesque, but is also a large and useful lumber tree. In the forest it holds its head aloft on a clean, straight trunk. Its medium-sized flattened top is composed of many heavy twisted

branches. The usual size is 2 to 4 feet in diameter and 80 to 100 feet in height, but elms 8 to 11 feet in diameter and 120 to 140 feet high have been known. One of the largest American elms on record was the Hatfield Elm, in Massachusetts, which had a circumference of 34 feet at a point 3 feet above the ground.

The elms belong to the nettle family, and about fifteen species are known in the world, most of which are trees. Six species are native to North America. The American elm is commonly known as white elm and sometimes as gray elm or water elm. It is found growing native from Newfoundland across Canada to the Rocky Mountains and south to Florida and Texas. Few of our trees have a wider distribution. Associated with it in portions of its range are the slippery or red elm, the cork or rock elm, and the winged elm or wahoo. The English elm has also been planted in the eastern United States to a limited extent.

The American elm is so well known that it requires little description. The bark of the trunk is rather thick and rough, dark gray in color, irregularly furrowed into wide, flat, firm ridges. The ridges are sometimes covered with flaky scales, or, on old trees, with corky plates, that give the trunk a somewhat shaggy appearance.

The twigs at first are greenish and covered with down,



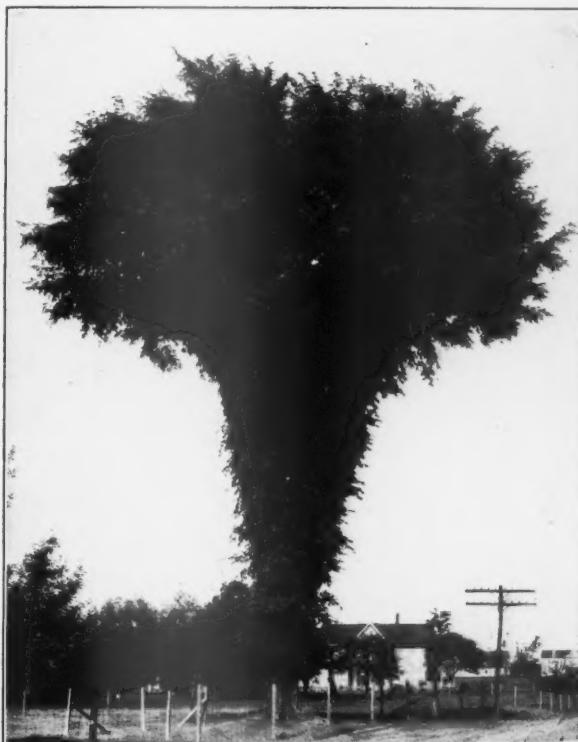
THE OAK TREE TYPE OF ELM

In this type is seen all the sturdy dignity of the oak, which it greatly resembles. The tree is not, however, of frequent occurrence.

later they are smooth reddish-brown. Older branches have ashy, gray bark. The symmetrical development of the elm top is due to the regularity with which the branches divide and subdivide by forking. The twigs of the American elm are readily recognized from those of the slippery elm by their lack of the mucilaginous inner

bark, which characterizes the latter. The twigs of the cork elm have irregular corky ridges; twigs of the winged elm also develop corky ridges which are wide and much flattened.

The leaf buds are small, sharp-pointed, usually smooth and covered with six to ten overlapping reddish-brown scales. The flower buds are larger than the leaf buds, somewhat flattened and farther from the end of the twig than the leaf buds. The buds of slippery elm are easily told from those of white elm because they are larger and coated with an abundance of golden-brown hairs.



Photograph by C. C. Laney.

#### THE VASE TYPE OF ELM

This tree, which is on the Latta Road near Charlotte, N. Y., is known by the residents in that vicinity as the "Golden Rod" and the "Boquet." Frequently the vase type of elm is feathered, as is this tree, but elms of other forms are also feathered; the small branches on the trunk growing nearly to the ground. The effect thus produced is very pleasing.

The leaves are spaced singly on the branches. When they first come out of the bud they are folded like little fans; when full grown they are 2 to 5 inches long, 2 to 3 inches wide, sharp-pointed, with prominent, evenly spaced veins that run straight from the midrib to the saw-like edges. The upper surface of the white elm leaf is fairly smooth to the touch; that of the slippery elm is rough whichever way it is rubbed. The two halves of the elm leaf blade are unequal at the base. It is interesting to study the arrangement of elm leaves on the branches in the summer. It will be seen that the leaves are so shaped as to fit closely to the branch and each leaf in relation to the others stands so that all receive full benefit from the sunlight which they require to elaborate the food of the tree.



#### ONE TYPE OF AMERICAN ELM

This is known as the low-headed form of the willow type. Note the flat spread and compare it with the other forms of this well-known and well-liked tree.

The flowers of the white elm appear in March or April before the leaves, and are among the first heralds of the coming spring. They are perfect, that is, each flower has the pollen-forming and seed-forming elements, but they are so small and so inconspicuous in color and size that they may be mistaken for unfolding buds. The fruits (samaras) ripen before the leaves have fully developed and themselves look like tiny, oval leaves. The seed is small and flat and surrounded on all sides by a wing which is deeply notched at the tip and the margin of the wing is fringed with hairs.

The wood of the American elm is heavy, hard and strong. Because of its interlacing fibers the wood is very



A RARE FORM OF AMERICAN ELM  
It is not often that this form of the elm is found.



AMERICAN ELM IN WINTER

It is easy to identify the elm in winter. This is the winter form of the feathered type of the white or American elm.

difficult to split. Oliver Wendell Holmes graphically describes this quality of elm wood in "The Wonderful One-Hoss Shay":

"The hubs of logs from the settler's ellum,  
Last of its timber—they couldn't sell 'em;  
Never an axe had seen their chips,  
And the wedges flew from between their lips,  
Their blunt ends frizzled like celery tips."

The wood of the elm is easily recognized by the peculiar wavy arrangement of the fibers when a smooth cut is made across the ring of annual growth.

American elm grows in almost any soil but prefers deep rich loam. It has been little used in planting for forestry purposes. But in reforesting soils too wet for farming it will undoubtedly prove valuable in many localities. Young elms sometimes grow an inch in diameter in two or three years, but ten or twelve years to an inch is nearer the average growth. As an ornamental and street tree the American elm is unsurpassed, but it is subject to so many insect enemies that it cannot be recommended for planting in New England. It is a favorite food of the gypsy moth, leopard moth, brown-tail moth, and the elm-leaf beetle is its special destructive pest. The beetle and its larvae feed on the elm leaves from May to August, and by preventing the growth of new foliage, exhaust and kill the tree. The remedy is to spray liberally with an arsenical solution as soon as the insect begins its work, and spray again after a ten days' interval, to destroy young larvae that hatch after first application.

On account of the toughness of its wood it is little injured by storms, but in a smoky atmosphere this tree does not thrive because its leaf surfaces become thickly coated with soot. Because of its fibrous, shallow root system, the elm is easily transplanted and even very large trees may be successfully moved. The roots run out to a great distance from the tree and will clog the drain pipes if the joints of the pipes are not thoroughly closed.

Too little attention is given to arousing public interest in the splendid elms or other notable trees which exist in most localities. Trees prized because of large size, perfect form or historical associations should be known and enjoyed by all, and should be carefully preserved for the benefit of future generations. Passers-by would be glad to know the life-stories of famous trees, and public-spirited citizens and associations might well make systematic efforts to have appropriate tablets erected, giving the history of every noted tree in the community.

## Commercial Uses of the White Elm

THOUGH the white elm has long been held in esteem as an ornament, it has been in use a still longer time. In some regions, in early times, the bark was more valuable than the wood, because it could be stripped from the trunk during most of the year and could be separated into strands of which cordage was made. The Iroquois Indians in western New York were able to make serviceable canoes of elm bark. Such canoes were all one piece, not many pieces sewed together, as when canoes were made of birch bark. An elm trunk 20 feet or more in length was peeled, the

bark turned inside out, the ends rolled up and tied, the central part spread wide and secured by thwarts, and the canoe was ready for service. It is recorded that Captain Blacksnake (an Indian) once visited Pittsburg in such a canoe which he made on the head of the Allegheny River; and Peter Kalm long before that described the process by which the Mohawk Indians made them.

Ropes of elm bark appear to have been in pretty general use. They were common in New England, New York, and North Carolina. With such ropes the Indians dragged their canoes, tied their tent poles, hung up

their fresh game, and trussed up their luggage when on the hike. In the south, strands of the bark (also of wing elm) were used in bagging cotton, and thin strands were sometimes employed in bottoming chairs. It was woven into large, coarse baskets for use about the farms, but such baskets were not good for as much wear as baskets made of hickory or oak splits.

## SHIPS AND BOATS

The English who settled in New England were constantly on the lookout for ship timber. There was abundance of white pine for masts, but hard-woods for ribs and planking were needed, and elm was one of the earliest of American woods to be given a trial. Shipbuilders in Maine appear to have been the first to use it for keels. It stood strains and shocks remarkably well and offered reasonable resistance to decay. It was tried near the same time for piling, and it is so used to this day. It stands the pounding of waves and resists the impact of vessels snubbing up to piers.

The wood enters into boat building, from the longest ship down to the canoe where its place is the bottom board laid inside, on which occupants stand and walk. Barge builders use it in practically all parts of those huge clumsy vessels. It is recommended by its toughness and strength, and also by its wearing qualities.

It was one of the early exports to England where the builders of ships used it for gunwales, garboards, slips, grating, fenders, planking, ladders and the lining of the



THE WEATHERSFIELD, CONNECTICUT, ELM

It is claimed that this is the largest elm in Connecticut. Its circumference is 27 feet 1 inch; its spread 142 feet 8½ inches and it is about 175 years old.

vessels. It was employed for similar purposes by ship-builders in this country. It was sometimes laid for decks but objection was urged against it because it became rough, and was sometimes inclined to rise in splinters. One of the properties which made it popular was its whiteness. No matter how stained and foul it became, a vigorous application of soap, sand, water, and the scrub brush made it white. That quality is said to have given it the name white elm in the shipyards, but the light color of the bark appears to have been responsible for the name in other regions. The whiteness of the wood, after an application of the scrubbing brush, is still appreciated, not only among boat builders but by makers of refrigerators and cold storage plants where unpainted woods must be used and it is desirable to keep them clean and attractive.

An examination of detailed reports of boat building in the principal states where that industry is carried on shows that



THE BENEDICT ELM

This elm is in Wilton township, Fairfield County, Conn., its circumference is 14 feet 11½ inches; and its spread is about 105 feet. It was photographed and measured by Norman De W. Betts.

white elm is employed in small quantities only. It is probable, therefore, that the wood was more important in boat and ship building a century or more ago than it is now.

#### COOPERAGE

White elm is one of the most important slack cooperage woods of this country and it has long held that place.



THE JUDD ELM

This elm on West Main Street, New Britain, Conn., was planted by Morton Judd in 1822 and the bronze tablet on it notes the fact. About 5 feet from the ground it measures 10 feet 10½ inches in circumference and its spread is 105 feet. A nephew of Morton Judd occupies the house in front of which the tree is planted.

Vessels belonging in this class of cooperage are intended for commodities other than liquids, and the number of such commodities is very large. Flour, sugar, and cement are among the most important. Formerly flour barrels were made of red oak to the exclusion of most other woods. Then cottonwood came into use in regions where it was abundant, but white elm later became the prevailing material, and it still holds that place, but is manufactured into barrels of many other kinds. It meets practically every requirement of the slack cooperage industry. It is tough, light, cheap, and possesses the necessary strength. The wood is easy to season and is not difficult to work. It is employed not only as staves but also as heading and hoops. It was one of the first woods utilized in making flat hoops in large numbers.

Elm staves are produced in a score of states, and the number in 1910 was 130,374,000. Red gum, pine, and beech were above it, and all other species were below. Michigan led all the other states in quantity, and was followed, in the order named, by Missouri, Indiana, Illinois, and Arkansas. The output is declining, and this is apparently due to lessening supply of elm timber near the centers of stave manufacture.

Elm not only leads all other woods in the production of hoops, but it exceeds twenty-fold all other woods combined. Elm, therefore, becomes practically the only hoop wood in the country. There is an apparent tendency to fall off in number, but the loss in elm is not made good by increase in the output of any other woods. The substitution of wire and other metal hoops accounts for the decline in wood. The elm hoops reported in 1910 numbered 283,029,000 and Ohio ranked first in production, followed in the order named by Michigan, Missouri and Indiana.

Though red gum is the leading stave wood for sugar barrels, white elm is important; and it is likewise important in the manufacture of apple barrels, butter tubs, candy pails, and buckets for tobacco. Pails and tubs are usually listed as woodenware, but they are none the less in the cooperage class. Many sizes of vessels are made other than those of regular barrel dimensions.

#### FURNITURE

Elm does not hold a place of first importance as a furniture wood, yet it is useful in the manufacture of a number of commodities. It was not much used for furniture making in early times, as it was seldom mentioned. Such was naturally the case, for better woods were plentiful in all regions where elm abounded, and it found place only after others that had been preferred be-



Photograph by J. R. Simmons.

THE CENTER OF MASSACHUSETTS  
This elm, near Paxton, Worcester County, Mass., marks the exact center of the State. The circumference is 14 feet 8 inches and the spread before the removal of the largest branches was 85 feet. The tree, like many famous elms in New England, is entering the last stages of old age and decay.

came scarce. The "orham wood" of which church pews were sometimes made in England is said to have been white elm from the eastern part of the United States.

In recent years elm has been successfully finished in a number of styles highly attractive. Some of the wood thus finished resembles the heartwood of sweet and yellow birch, other is of lighter tone and might pass for the sawwood of birch, or for maple, and by deepening the color the wood becomes an imitation of cherry. The resemblance to other woods is secured by giving elm colors similar to those of the woods imitated, and not by copying figure and grain. Few woods possess as little natural figure as elm, and stains and fillers do not impart much figure because the annual rings are not clear cut, large pores are not numerous, and medullary rays are small and inconspicuous.

Elm's place is in cheap furniture or in the interior parts of more expensive kinds. Reports by manufacturers indicate that the total demand for elm by furniture makers is above 20,000,000 feet a year. The Ohio Valley, with Michigan, Wisconsin and Missouri, use most of this wood that goes into furniture. A rather large quantity is employed in chair making, including chairs for children, invalids and for camps. The wood



THE STIRLING ELM

This is on the estate of Mr. Henry E. Pellew of Sharon, Litchfield County, Conn. At a point 4 feet above the ground it is 18 feet in circumference. Its greatest spread is about 90 feet. It was planted between 1750 and 1755.

is employed in the manufacture of kitchen tables and other furniture, because of the ease with which it may be kept white by scrubbing. Its usual place in furniture making is as frames. It is listed as material for mission furniture, billiard table rims, bed slats, china closets, and benches and stools. Elm is well suited for bentwood work. It bends nearly as easily as hickory, but is not as strong and does not take as smooth polish. Splinters are more liable to rise from the surface than when hickory is the wood employed. In Michigan white elm is reported as church pew material.

#### BOXES AND CRATES

The facility with which elm may be bent without steaming or otherwise heating it makes it excellent crate stuff, particularly where long pieces are wanted as when furniture and machinery are shipped. Thin elm boards, 10 feet or more in length, may be bent in the form of a circle without breaking. That quality is valuable for certain kinds of crating.

The annual demand for elm for boxes and crates ex-

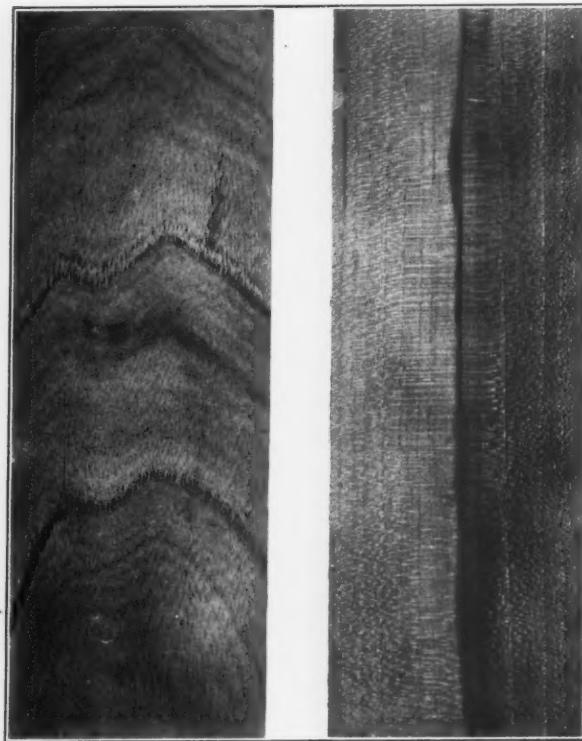


HOOPS MADE FROM ELM

Elm is the principal wood used for hoops in the slack cooperage industry. In 1910, the last year that statistics of this kind were gathered, there was produced a total of 29,571,200 hoops. Of this quantity 28,302,900, or nearly 96 per cent, were of elm.

ceeds 40,000,000 feet a year in the United States, or about 15 per cent of the total sawmill output of this wood.

Baskets when made of elm are classed as boxes, since they are generally of the kind used as shipping contain-



AMERICAN ELM

Tangential or bastard cut. The rows of pores which mark off the annual growth rings form wavy lines.

Radial or quarter sawed section. Rows of pores in a vertical line. Pith rays or "silver grain" inconspicuous.

ers. Frequently a part but not all of a basket is of elm. The hoop or band round the top of the vegetable or fruit shipping basket may be of this wood, while the veneer or thin splints composing the sides is of another, and the bottom may consist of a third.

Smaller boxes of finer finish are made of elm. The best example is the cigar box, which has a core of this wood with a veneer of Spanish cedar. The purpose of the cedar is to supply the odor which is usually insisted upon by the purchasers of cigar boxes. Recently, however, a finish for elm has been perfected which is acceptable in the box trade without any veneer. The odor is lacking or is artificially imparted, while the elm is bought and sold as "Michigan cedar."

Manufacturers of small boxes, such as are used for knives, forks, spoons and similar ware in dining rooms and kitchens, list white elm among the woods used. Some of these boxes are so nicely finished that they pass for cherry or birch.

#### VEHICLES

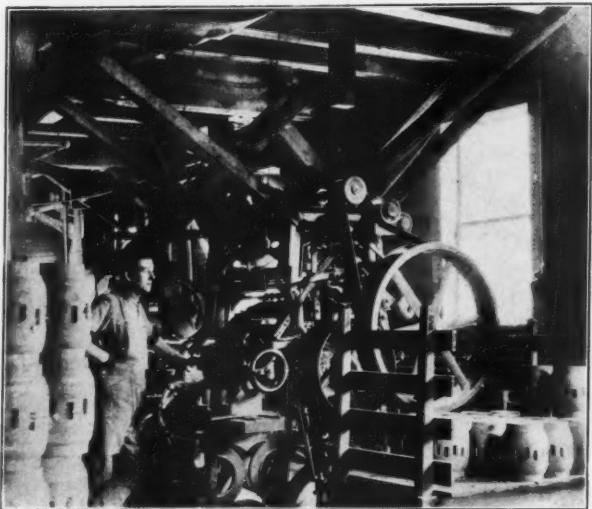
Elm wagon hubs have been in demand since the first wagons were made in this country. The wood is valuable chiefly because it is difficult to split, and hubs stand hard

usage. It is not quite as hard as oak and much softer than hickory, and large spokes of heavy wagons are liable to wear the hub mortises and work loose. Otherwise, this elm would be as good hub material as the forests produce. The latest demand for white elm by vehicle makers amounts to about 20,000,000 feet a year; but this goes into various kinds of wheeled vehicles, constitutes different parts, and is important in the manufacture of sleds and wheelbarrows, and also automobiles. In Missouri white elm is much employed for cart axles, in Michigan for auto bodies, in Kentucky as wagon tongues, while numerous patterns of sleds are made of it from the strong and clumsy steamboat to the hand sled which children use. It is likewise manufactured into accessories of vehicles, particularly singletrees, double-trees, eveners and neck yokes.

#### MISCELLANEOUS

White elm enters into a large number of miscellaneous articles. There are few industries which use wood that do not find place for more or less elm. It is said to have been split for rails on the western frontiers in early times, particularly in Iowa. But that use could not have been extensive because elm is difficult to split and no rail maker would tackle it unless nothing better was available. In the paragraphs which follow, mention is made of some of the uses which white elm has been reported.

It supplies timbers on which heavy cannons are mounted, either in place or on carriages; fixtures for banks, offices, stores and saloons; interior finish for



A FAVORITE FOR HUBS

In the vehicle industry elm is highly prized as raw material for hubs. It is especially important for use in the manufacture of wagon wheel hubs. The accompanying picture shows the interior of a hub factory with a number of finished elm hubs in the foreground.

houses. As fixtures and finish it generally occupies a place out of sight, and serve as frames, braces and stays. In some instances it is given artistic finish and there compares favorably with birch and cherry. A lower class of service is given when elm is employed as stall and



ELM USED FOR MUSICAL INSTRUMENTS

Elm stands sixth in point of quantity among the woods used in the manufacture of musical instruments, a total of over 15,500,000 board feet being required by this industry. It is required for various purposes and is particularly adaptable for being work. The accompanying photograph shows an elm log being cut up into bolts preparatory to its manufacture into banjo rims.

stable fittings, especially as floors, mangers and stanchions. It finds a place as henroosts in poultry yards, and when reduced to rods and dowels of small size it is utilized in making coops. It is likewise listed as material in the manufacture of brooders and incubators.

Makers of wooden pumps have places for elm. It is good for handles and sucker rods, and is placed as flooring over wells where pumps are employed. In kitchens and pantries it is regarded as very good wood for drain boards, because it is easily kept clean. Makers of ice boxes like it for its good, scrubbing qualities, and this consideration, as well as its wearing qualities in water, makes it popular material for parts of washing machines, washboards and wash benches.

In the manufacture of agricultural tools and implements it goes into cultivators, seed boxes, root cutters, potato diggers, sieve frames, bushel measures, riddle rims, and horse powers. Car builders make grain doors of it and it enters into different parts of freight cars.

Considerable quantities of elm are used by makers of trunks, chiefly as slats for the outside and three-ply veneer for the inside. Few woods are considered equal to elm for trunk veneer, woodenware makers draw supplies from this wood for ironing boards, sleeve boards, sign boards, and it is likewise worked into brush backs, game boards and apparatus of various kinds, stepladders, merry-go-rounds, music cabinets, picture molding, telephone accessories, parts of various musical instruments, including pianos, organs, and banjos, cant hook handles, pulpits, croquet sets, roll paper cutters, tanner's liquor logs, shoe heels, and printers' supplies. These indicate the wide range of elm's uses in the wood-consuming industries.

#### YALE SUMMER CAMP

THE Yale School of Forestry has announced that a summer camp for young men will be held at Milford, Pike County, Pa., for eight weeks beginning July 1, 1916. The course is designed to give a clear view

of forestry in a general way, its ideals, and the qualifications and requirements of a student in technical forestry. It has been particularly planned to meet the needs of young men who are looking toward forestry as a possible profession, but who are uncertain as to their fitness for the work and who are not prepared to begin the technical training necessary for professional standing. It is also designed for those who are not contemplating forestry as a profession but who are interested in woodcraft and wild life and who wish to learn something of the broader aspects of forestry. In addition to the regular course prominent lecturers on wild life and other subjects allied to forestry will address the students at the weekly camp fires.

#### FOREST FIGHTING EQUIPMENT

MOTOR cars equipped with fire extinguishers will be operated by the Boston & Maine Railroad on the Portland division this spring and summer to guard the forests along the lines from fires. Members of the fire patrol squad will be trained men, conversant with local conditions and the topography of the woodlands they are protecting. The motor cars will have in addition to patent fire extinguishers, pail, shovel, hoe, etc., for fighting grass as well as wood fires. The railroad officials believe they can save thousands of dollars in this way. In the past fires caused by locomotive sparks have burned into adjoining timberlands and caused serious loss before they were discovered and reported to the railroad men, while the railroad, of course, is responsible for the damage. The motor cars are built to travel over the rails as fast as an express train. If a patrol discovers a fire which he cannot extinguish unaided, he is expected to race to the nearest telegraph office to summon aid. The section gang of this division are also being organized as an adjunct of the fire patrol system.

#### MONUMENT TO A TREE

PERHAPS one of the most curious monuments in existence has recently been built in Ontario by Canadians, says the *Popular Science Monthly*. The farmers have just erected a marble pillar to mark the site on which grew a famous apple tree.

More than a century ago a settler in Canada named McIntosh, when clearing a space in which to make a home in the wilderness, discovered among a number of wild apple trees one which bore fruit so well that he cultivated it and named it McIntosh Red.

The apple became famous; seeds and cuttings were distributed to all parts of Canada, so that now the McIntosh Red flourishes wherever apples grow in the great Dominion. In 1896 the original tree from which this enormous family sprang was injured by fire, but it continued to bear fruit until five years ago. Then, after fifteen years, it died, and the grateful farmers have raised a marble pillar in honor of the tree which did so much for the fruit-growing industry of their land.

The story of this apple tree illustrates the African proverb that though you can count the apples on one tree, you can never count the trees in one apple.



### THE MAGNA CHARTA OF THE REFORESTATION MOVEMENT IN CHINA

This document was the means of permitting Professor Joseph Bailie of the University of Nanking, China, to start the work of reforesting Purple Mountain near Nanking, which is now the inspiration of a widespread movement in China to teach the Chinese the need of forestry. The main portion is composed of the signatures and seals of the noted men who signed the document. Below the signatures will be found their names as spelled in English.

## Magna Charta of China's Forestry Work

Dr. JOSEPH BAILIE  
Instructor in Forestry, University of Nanking, China

THE November, 1915, number of AMERICAN FORESTRY contained an article by W. F. Sherfesee, Director of Forestry, Philippine Islands, entitled "The Reforestation Movement in China." In that article Mr. Sherfesee describes his visit to China to help us in opening our school of forestry in the University of Nanking and the survey he made of the southern part of the province of Antrim at the invitation of Governor Han. He also refers in rather flattering terms to the work already done by our university on the slopes of Purple Mountain, and draws conclusions from what he observed.

The object of this article is to add a few touches of human interest to what Mr. Sherfesee has written and to carry the history of the development of our College of Agriculture and Forestry up to date.

The illustration at the top of this page may seem to some a meaningless waste of printers' ink. To others it may seem a proof of the superannuation of "old Bailie." To the writer and those associated with us in the beginning of this work it is the Magna Charta of "The Reforestation Movement in China." It had its origin in the following way.

The fall and winter of 1911 found the writer engaged in giving relief work around the University of Nanking, China, and in the Mission compounds to 700 or more famine refugees. We made roads, filled ponds, drained unusable lands, and did other work. The object, however, behind the colonization movement was not to engage a

horde of laborers during famine times, on our own compound, letting all the advantage gained by the labor accrue to us in the form of rendering our residence less unsanitary, or to enable Americans to reach their own doors without having to wade knee deep through mud, however desirable all these results might be, but to use money contributed for the relief of the poor to produce results which would also be for the poor and not for their wealthy benefactors. It was only after the republic was set up in Nanking that we were able to inaugurate this movement, by the purchase of about one thousand English acres of the northwest slope of Purple Mountain.

Prior to this we had already organized the Colonization Association, which is composed of foreigners and Chinese, with *Chang Chien* as the national head. As one of the main functions of this Association is to hold lands in trust for the poor and as, according to present Treaty Rights, foreigners can not hold land in China, our board of trustees had to be all Chinese. So the land on Purple Mountain, though paid for out of money contributed both by Chinese and foreigners, was held in the names of five Chinese, though the documents were left in my possession as manager, pro tem.

On acquiring the Purple Mountain estate we were enabled to carry out the idea of accumulating for the good of the poor the results of their own industry, and to raise the number of those employed. We dug canals, grubbed stones out of the land, made roads and drives with these stones, levelled uneven places and made an

orchard and plantation of mulberries on the place, up to that time inhabited only by the ghosts of the departed. It was not until after consultation with some wide-awake Chinese friends that I dared to remove the graves scattered over about 100 acres and form a neat little cemetery, thus leaving the rest for the use of the living. This happened close on the heels of the establishment of the republic.

Though the parties really interested in these graves were perfectly satisfied, others, no doubt, from a sense of mistaken public duty, organized a campaign to stop us in our work. Hearing of this and knowing that any day a proclamation might be forced from the Tutuh<sup>1</sup> of Nanking stopping the whole work, I went to Shanghai to ask advice of Chinese friends. One of these, Mr. Huang, then Chinese secretary of the Famine Relief Committee, told me that I could never succeed as I was doing. I asked him what he thought I should do. He put his hand in the drawer, pulled out a sheet of paper and wrote the Chinese characters which form the solid block of

Chinese on the photo at the top of this article and when he had finished handed it to me and said "Go and get somebody to sign that." I was nonplussed, didn't know where to begin, and with heavy heart, took the document to Nanking. Something had to be done because the forces against us were coming to a head. Dr. Macklin, as soon as I showed him the document, rubbed his hands with glee and said, "We'll send it in to Sun (the provisional president of the new republic) before he leaves for Peking." We did so and he wrote the first two characters, Sun Wen (the official title of Sun Yat Sen) and stamped it with the seal of the republic. Not only so, but Tang Shao I, who had been sent down as representative of the northern forces to induce the Nanking government to go to Peking, also signed it, but as he hadn't his seal with him, no seal mark is attached to his name. Next day we sent the document to Huang Hsing, who was then the generalissimo of all the southern forces, and he signed and sealed it. Now we were ready for eventualities. Two days after Huang Hsing's signature the con-



THE NANKING BRANCH OF THE COLONIZATION ASSOCIATION

This picture was taken on the occasion of the visit of His Excellency Chang Chien, then Minister of Agriculture and Commerce, when he, with Consul Williams, representing the American Minister, Dr. Reinsch, arrived to plant trees commemorating the opening of the School of Forestry in the University of Nanking, March 14, 1915.

His Excellency is the central figure in the front row.  
Front row—left to right: (1) Dr. Williams, Vice-President of the University of Nanking; (2) Dr. Macklin, who the Chinese say prevented the burning of the city of Nanking; (3) Wu Chi-chang, Magistrate or Mayor of Nanking; (4) Wang She-tong, the Taojin or official in charge of the one-third of the province of Kiangsu, of which Nanking is the capital; (5) His Excellency Chang Chien, Minister of Agriculture and Commerce and as a private individual the greatest developer of industry in China and National head of the Colonization Association; (6) Yu Chi-chi, representing the Civil Governor who was absent on a tour of inspection of the province; (7) Ma Ting-shu, representing the General; (8) Wang Kwei-ling, Chief of Police, Nanking; (9) Tang Tan-ya, Manager of the Nanking Branch of Kiangsu Bank.  
Second row: (1) Pu Chi, Secretary to Civil Governor; (2) Lu Tien-hu, Commissioner of Education for the Province of Kiangsu; (3) Chan Hsish-ren; (4) Wu Tsing; (5) Chen Sien-chah; (6) Li Mun-tsing; (7) Nagan Han, graduate in forestry, Ann Arbor, Michigan, and Secretary in Bureau of Forestry in Ministry of Agriculture, Peking; (8) Chang Tsen-pi, Chief Auditor for office of Road-builder and Secretary for Colonization Association; (9) Kang Hung.

Third row: (1) Shen Tung-Fang; (2) Ping-sun; (3) Su Si-tai, President of Nanking Chamber of Commerce; (4) Tsui Kuei-sung; (5) Su Chang-sih; (6) Joseph Baiile; (7) Tao Pao-tsing, formerly representative to National Assembly; (8) Yeh Hsi-chi; (9) Chu Shou-ren; (10) Yang Hsi-chang.

Back row: (1) Wu Chiu-hsiau, President of Nitrate Mines; (2) Ku Chi, Investigator at Civil Governor's; (3) Li Si-yuen; (4) Huang Kuci, Director of Agricultural Station of Colonization Association on Purple Mountain; (5) Chiu Tsai; (6) Chiu Fu-ching, President of Law School of Kiangsu; (7) Chiu Lai-chih, formerly Vice-President of Kiangsu Provincial Assembly, head of the gentry of Nanking, and President of the Nanking Branch of the Colonization Association; (8) W. R. Stewart, Y. M. C. A. Secretary for Nanking.

<sup>1</sup>The Tutuh was an official position created under the New Republic exercising the power of Governor and General combined.

servative forces at work in Nanking had succeeded in having the Tutuh issue a proclamation prohibiting my going on with the work on Purple Mountain until the matters brought against me by these societies had been discussed and disproved. This I knew meant a full stop to the work as I would not attempt to disprove facts. However, I reasoned thus. Here is the proclamation of a Tutuh. But prior to the Tutuh's issuing this procla-



SCIENCE HALL, UNIVERSITY OF NANKING

This substantial building, thoroughly modern in every respect, is an indication of the up-to-date methods of education at this university.

mation, the generalissimo had endorsed our work. He cannot use soldiers without the permission of his superior. His superior will not stultify himself by sending soldiers to stop what he has signed to support. Here I am with about a thousand able-bodied men with picks, shovels and spades, and no paper emanating from any source but that of brute compulsion is going to drive us off this mountain, seeing we are fighting literally for the right of the poor to work to keep life in.

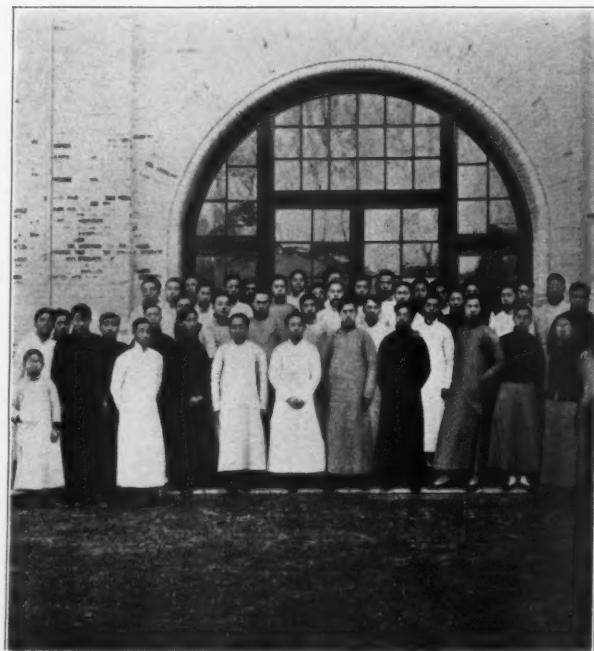
The morning following the posting of the proclamation in the tea house at the foot of the mountain, I was detained in the city seeing after other matters, and it was nearly 9 o'clock when I reached the place of roll call. When I reached the place, all the squads of workmen were standing ready for work, but the foreman and students in charge did not dare to order the men to turn a sod in face of the proclamation. Pretending to be incensed at the remissness of all and pretending also to be ignorant of the proclamation (of course nobody was deceived), I asked each squad leader what he had been doing yesterday and ordered him to take his men and go on with the work. They all went quietly and as if in dread of some evil. But 12 o'clock came and no squad of soldiers appeared to stop us. Night came and we were still in possession. The next day everyone expected something dreadful. But nothing came and by night they had all settled down to the belief that they must have behind them good, if not better, backing, than the Tutuh. The political game threw the Tutuh out of office three days after the issue of this proclamation, and it would be hard to make these one thousand workmen believe that his issuing of this proclamation had nothing

to do with his dismissal, though as far as I knew it had nothing to do with it.

As soon as we heard that Cheng Leh Chuan was to be appointed new Tutuh, Dr. Macklin and myself jumped on the train and went down to Soochow and presented the document to him for signature. "Of course, I shall sign it, for this is just the sort of work that is going to save China," was the prompt reply of the good man. As soon as he came to Nanking we were safe from any further direct attacks. We were allowed to go on and gain by active philanthropy those who opposed us with their theories.

This opposition was not fully overcome till after the second revolution. At that time, the city of Nanking was taken and sacked by the barbarous soldiers of Chang Hsun. Had it not been for Dr. Macklin, for whom the old general held a high regard on account of having saved the lives of some of his generals, the city would have been burned. As it was all the gentry that could get away fled to Shanghai, where they were safe in the foreign settlement, leaving their wives and children in the university and mission compounds, and leaving us to look after them as best we could.

To alleviate the suffering from cold and hunger that



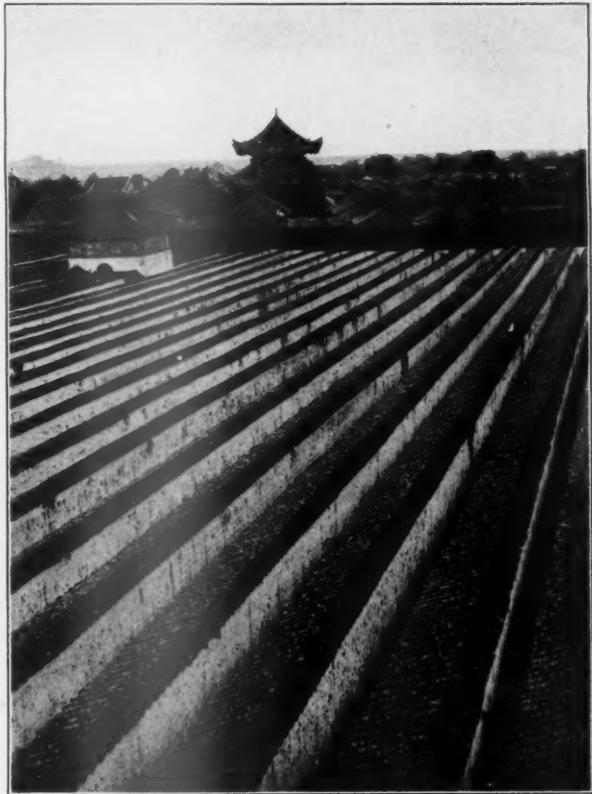
HIGH SCHOOL LITERARY STUDENTS

From this class of bright, capable young men is recruited the students who take the course of instruction at the University of Nanking. The future of China depends largely upon such of her young men as these.

came in the wake of the looting of the city, money and rice began to be sent. But how were they to be brought to Nanking, seeing that Chang Hsun had threatened to commandeer all the Red Cross supplies and use them for his soldiers. At this point the foreigners in charge of this work in Nanking sent the writer to Shanghai to bring up relief in the shape of money and help in any way

possible. On the day of my leaving Shanghai to bring money, rice and clothes to the sufferers in Nanking, there awaited on me at the Shanghai station of the "Shanghai-Nanking Railway" not a delegation of the gentry of Nanking, but practically the whole of the Nanking gentry, thanking me personally for what I was doing and especially Dr. Macklin for having saved the city, and all the missionaries for having remained and saving the people, when they themselves, who ought to risk their lives as "fathers and mothers of the people," had deserted their post. They expressed regret for having opposed us in the work of the Colonization Association and said they were now shamed into cooperating in what they now knew was an unselfish enterprise.

As soon as order was established and the city of Nanking had paid an indemnity of 800,000 taels the gentry were allowed to slip back into Nanking. No sooner than it was safe to organize a meeting they met with us and established the Nanking Branch of the Colonization Association, appointing three of their members as trustees. At the next meeting I handed over all the documents of Purple Mountain to the president of the Nanking branch, Mr. Chin Chiheng, the head of the Nanking gentry and a Hanlin. Never have I seen more astonished faces than on that day when the deeds of the land over which there had been so much fighting and on which close on to thirty thousand dollars had been spent in developing, were handed to the legal owners. The association had been formed and the burden of



EXAMINATION CELLS AT NANKING

In these cells the Chinese students took their examinations while keen-eyed observers in the towers placed at intervals watched to see that the work was done fairly.

holding these deeds was taken off my shoulders. Since then any doubt that existed that what we were doing has anything of selfish motives in it was entirely removed. They look upon us Americans as their friends.

The American government's foregoing its legal right to take from the Chinese government the Boxer indemnity; the turning of this indemnity money into a fund to found the Tsing Hua College at Peking to prepare students to come to the United States for a university training and then after being prepared to come here, to pay their expenses while here; this generosity of the American government has made America beloved by that very class that is to rule China in the near future. But we need also the personal element to cement that friendship of the two nations and this we believe is found in such institutions as our College of Agriculture and Forestry of the University of Nanking.

The Chinese nation is unconquerable. It swallows up its conquerors. The Manchus came and subdued the nation, but where are the Manchus now? They are lost and are absorbed by the great Chinese people. Nor are the Manchus the only conquerors that have been absorbed. Let others that think of the partition or subjugation in part or in whole of the Chinese nation keep these facts in mind. America has the confidence of every Chinese of intelligence both in the United States and in China. Any approaches now made to help the nation to develop



EXAMINATION TOWER

A close view of one of the towers at the examination halls at Nanking, China.

its national resources and then alleviate the condition of the worthy poor will be appreciated and backed by cooperation from the Chinese. As an instance of the readiness of the Chinese to benefit by any help we can afford, the minister of agriculture and commerce has shut the Government School of Forestry in Peking and sent twenty-four of the best students to our school, thus making ours the national school of forestry. Not only so, but on my departure from China for the United States he gave me a letter of commendation in which he stated that if we can establish certain institutions in connection with our school, the university, he will cooperate with us. Not only have I his letter commanding this work to the American public, but Dr. Reinsch, the American minister in Peking, has given his letter recommending the work to his government and the American people.

In response to this, Secretary of Agriculture Houston has offered to grant leave of absence to those in the government employ who can be spared and may desire to spend one, two or more years helping us to develop the work around Nanking. Mr. Graves in the Forest Service has done likewise. But these officials cannot provide payment for such men without an act of Congress.

Were I in position to do so I should urge the granting of the money by act of Congress or the using of some part of the indemnity money for this work, and my reason is as follows: First, we can help a great nation in need. Second, we can help a great nation that will appreciate the help. Then comes the selfish reason. China is to be the greatest nation on earth when she is developed. Are we to fight her or are we to have her as a close friend? The opportunity is now given to the United States to save China from her enemies and to seal her as an eternal ally. No one who knows the Chinese character as those of us who have spent over a quarter of a century among them, can doubt of the undying friendship that the Chinese have for those whom they trust. I can reckon among my very stanchest friends the very men that fought me from a mistaken fear that I was going to "do" them. They had good reason to fear me and I don't blame them. Foreigners have come and have done things in the name of helping China that make us all hang our heads. But once the Chinese trust you, there's no such a thing as trusting half way. You're a bosom friend. America as a nation is on the straight road to become that bosom friend of China, and a grant now in response to the appeal of the minister



DR. JOSEPH BAILIE

Of the University of Nanking, China, who is now in the United States endeavoring to arouse interest in China's forestry problems and secure assistance in reforestation work.

of agriculture would do a great deal to seal that friendship.

But as I cannot hope for this government grant I appeal to the patriotism of our countrymen to assist in one of the greatest schemes now before the human race, the afforestation of China. We have arrangements made for the carrying out of plans in connection with our university. The government of China has given us as first installment of lands a grant of ten square miles. The minister has asked us to show the Chinese nation, on this and other tracts that will be donated when this is planted in trees, how to go about the forestation of the country.

The American government is willing to aid in lending men who know how; who will help out in giving the salaries of these men?

My trip from California to the East was made possible by Major Ahern's kindly enlisting the financial help of Charles Lathrop Pack, of Lakewood, N. J., the president of the American Forestry Association; Dr. Henry Sturgis Drinker, former president of the American Forestry Association, and Capt. J. B. White, Kansas City, Missouri, a director of the same association.

Anyone desiring to help this work kindly address Dr. Robert E. Speer, president of the board of trustees of the University of Nanking, 156 Fifth

Avenue, New York City, or President A. J. Bowen, University of Nanking, Nanking, China.

#### FERTILIZER FROM WOOD ASHES.

THE present isolation of the large potash beds at Stassfurt, and the consequent rise in the price of this important fertilizing ingredient, have led the Department of Forest Utilization of the New York State College of Forestry to make some few tentative studies into the commercial production of potassium oxide from hardwood ashes by burning and leaching. The Department is tempted to state that there is a good market for the soluble salts that can be thus obtained, in view of the fact that such salts are at present bringing from ten to twelve cents per pound, with a very good prospect of their going much higher in the near future.

#### POTASH IN WOOD ASHES

THE increase in the demand for potash has resulted in a number of inquiries of Government officials concerning the amount of this chemical contained in wood ashes which may be available at sawmills operating on the National Forests.

# The Bird Department

By A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University

## THE RETURN OF THE BIRDS

IT is now nearly three months since the first horned larks started northward over snow-covered fields. Already they have their young on the wing and are ready to start another brood; yet there are many birds that still have hundreds, even thousands of miles to travel before they will reach their nesting grounds. The March robin brought forth its crowd of admirers, the call of

lark, and mourning dove, which come during March, are much less regular because of the idiosyncrasies of the weather. If there were no such thing as weather and if food were always equally abundant; if it were one great level plain from the Amazon to the Great Slave Lake, the birds would swing back and forth as regularly as a pendulum and cross a given point at exactly the same time every year. For this migrating instinct is closely associated with the enlargement and reduction of the reproductive organs, a physiological cycle which, under normal conditions, is just as regular as the pulsing of the heart and records time as accurately as a clock. With most species the organs of mature birds begin to enlarge before those of birds hatched the preceding year, and those of the males before those of the females. Because of this, the male birds arrive first and are followed by the females and later by the immature. With some species like the robin, bluebird and phoebe, there is very little difference in the time of arrival, but in the case



FOUR HUNGRY BABES

A Louisiana water thrush feeding its young. This bird winters from Mexico to Colombia and arrives in the northern United States during the first of April.

the bluebird drew a response from others, but now when every hedge-row and thicket resounds with musical voices and even the trees of the city streets flash with brilliant warblers, everyone likes to stop and listen and notice the unusual number of birds. And we cannot help wondering whence have come these little wanderers, where they are going, and what is the meaning of their journeys. In great waves they come from the South, flood us with beauty and song for a few days, and then pass on. Wave after wave passes over us during the course of the month until June arrives, when the last immature birds hasten on to their nesting ground and leave us with only our summer birds until the fall migration shall bring them back once more.

A little observation from year to year shows us that these May birds are extremely regular in their appearance and disappearance. One can soon learn just when to expect each species, and if the weather is normal, it will arrive on the day set. The earlier birds such as the robin, bluebird, blackbirds, Canada goose, meadow-



A BANK SWALLOW

Hovering over its burrow, these birds winter in northern South America and arrive in northern United States during the last of April.

of the red-winged blackbird, often a period of two weeks or even a month intervenes. This may be a wise provision of nature to insure the selection of a nesting area that will not be overcrowded for once the male has established himself, and it is often at the same spot year after year, he drives away all other males from the vicinity, awaiting the arrival of the females and particularly his mate of the previous year.

But with the later migrants, such as the shorebirds, that have a long way to go, the females usually arrive with the males, and with some species, courting takes place en route and they arrive at the breeding ground fully mated and ready to nest.

In the October number of *AMERICAN FORESTRY*, in considering the departure of the birds, mention was made of the distance traveled by different birds in their migrations and here again it is interesting to note where birds have wintered as explanatory of the time of their arrivals in the spring. The early migrants are those that have spent the winter entirely within the United States. This is true of all the March birds in the northern states but during the last of the month, the first birds from the West Indies and Mexico begin to arrive in the southern states. About the middle of the month many of the birds that have wintered still further south begin to ar-

return so accurately to their homes. That they do so is certain, for many birds have been marked so that we know that the same bird often comes back to the same place year after year and builds a nest close to the one of the previous year.

At one time it was thought that they had well-marked



A BUSY WORKER

This red-eyed vireo is busy repairing its nest. The bird winters in northern South America and arrives in the northern States during the first part of May.

rive, including the swallows, the spotted sandpiper, the black and white warbler and the water-thrush. The last of April and first of May brings even to the northern states the initial wave of birds from Central America and perhaps even northern South America and about the middle of this month, when occurs the height of the migration thousands of tiny warblers, vireos and fly-catchers that have been wintering on the slopes of the Andes or the pampas of Brazil, are winging their ways overhead to Labrador, Hudson Bay and Alaska. The shortest route which one of the very last to arrive, the blackpoll warbler, may traverse, is 3,500 miles, while those which nest in Alaska must travel over 5,000. Some of the shorebirds which bring up the close of the migration in late May or early June have undoubtedly come from Chile and even Patagonia and still have several thousand yet to go so that before they reach their nesting grounds again, they will have traveled 16,000 miles since leaving in the fall.

This constrains us to wonder how these tiny wayfarers are able to traverse such tremendous distances and still



A RING NECKED PLOVER

This bird winters as far South as Patagonia and does not reach the northern States until the last of May or the first of June.

highways in the mountains, rivers and coast lines, surveyed, as it were, by their ancestors and unfailingly followed by all descendants. But now it is believed that these highways are followed only so far as they afford abundant food and when the food supply lies in some other direction, they are regardlessly abandoned. What is it then that guides them mile after mile in their flights, flights made mostly under cover of darkness and often at altitudes varying from 2,000 to 5,000 feet above the earth? A sense of direction, it is now called, an instinct for recording directions as accurately as a compass which we, having only so crudely developed in ourselves, are at a loss to understand; an instinct which permits birds to travel north, south, east or west and not lose their bearings. For the migration route of most birds is not directly north and south, and many preface their southerly journeys by long flights directly east or west. The bobolinks and vireos of the northwestern states, for example, leave the country by way of Florida or the Gulf coast and first fly directly east to the Mississippi Valley to join the others before starting southeasterly. The white-winged scoters which nest about the lakes of central Canada, upon the completion of their nesting duties, fly directly east and west to the Atlantic and Pacific where they winter. Some herons preface their migrations by long flights, even to the north, so that occasionally little blue herons and egrets are found in the northern states during August and September.

With birds that travel such enormous distances, it is interesting to note their rate of advance. While it is possible for birds to travel great distances without rest, as witnessed by the fall flights of the turnstone from Alaska to Hawaii or of the golden plover from Labrador to northern South America, distances of over 2,000 miles across the open sea, they do not ordinarily progress far in single flights. The spring advance of the robin, for example, averages only 13 miles a day from Louisiana to southern Minnesota. The rate increases gradually to 31 miles a day in southern Canada, 52 miles per day by the time it reaches central Canada and a maximum of 70 miles per day by the time it reaches Alaska. It should not be inferred from this that each robin does not ever migrate less than 13 or more than 70 miles in a single day. Probably they often fly more than a hundred or two hundred miles in a single flight, as do, undoubtedly, many of the smaller birds, but after each flight they dally about



A PIED BILLED GREBE

The mother bird and two youngsters out for a swim. This bird spends its winters from the southern States southward and arrives in the northern States during the last days of March.

their resting place for several days before starting on again, and this brings down the general rate of advance.

The rate of speed at which birds travel is rather difficult to estimate except for the homing pigeons which can be timed from one place to another or the ducks and geese whose conspicuous flocks traveling high over cities and towns can easily be followed. The championship speed for homing pigeons has been recorded as 55 miles per hour for a period of four hours. A great blue heron has been timed by a motorcyclist keeping directly below it and found to be 35 miles per hour. A flock of migrating geese has been found to be traveling at a speed of 44.3 miles per hour and a flock of ducks at 47.8 miles. The speed of flight of smaller birds is usually less although when they mount high in the air and start on their migratory flight, they doubtless travel faster than the birds one so often passes flying parallel to a passenger train or suburban car.

The vast majority of birds migrate during the night; some migrate both by day and night, and others only by

day. The latter are, for the most part, birds that find their food in the open and can feed as they travel. Such are the robin, the kingbird and the swallows. Other birds, like the sparrow, vireos, warblers and marsh birds, that find their food in the seclusion of trees of dense vegetation, migrate entirely by night. The necessity for this is shown when they arrive at the Gulf of Mexico or other



REDWINGED BLACKBIRDS

These birds spend their winter in southern United States and arrive in the northern States during the last of February or the first part of April. The males often arrive two weeks to a month in advance of the females.

large bodies of water where it is impossible to get food of any kind. If they started early in the morning so as to be across by night, they would not be able to secure much food before starting, and by the time they reached the Mexican side, it would be dark and again impossible to feed. Thus an interval of thirty-six hours would elapse without food, a period that might result disastrously for many birds because of their high rate of metabolism. If, however, they spend the day feeding and migrate by night, their crops are full and when they arrive at the other side of the Gulf, it is daylight and they can begin again to glean their living.

During these night migrations birds are attracted by any bright steady light, and every year hundreds and thousands dash themselves to death against light houses, high monuments and buildings. While the torch in the Bartholdi Statue of Liberty was kept lighted, as many as 700 birds in a month were picked up at its base. On some of the English lighthouses where bird destruction was formerly enormous, "bird ladders" have been constructed forming a sort of lattice below the light where the birds can rest instead of fluttering out their lives against the glass. Again in crossing large bodies of water, they are often overtaken by storms and as their plumage becomes water-soaked, they are beaten down to the waves and drowned. Sometimes thousands of birds are killed by a single storm. But of course the vast majority sweep on and arrive at their destinations in safety.

And so if we step out on a cloudy night this month, when the birds are migrating low to escape flying through the mist-laden clouds, and hear their strange calls only faintly resembling their familiar daytime notes, we can picture to ourselves, the thousands of winged travelers returning from a sojourn in the tropics and pushing on through the black night, guided, by an innate sense of direction, pursuing their course straight to their old homes. We can think over the past ages through which this migrating habit has evolved to the days when all North America basked in a tropical sun and birds darted among the palms and tree ferns without ever a thought of leaving the land of their forefathers. Then we can picture to ourselves the coming of the ice age and the destruction of all the life that could not adapt itself to the changed conditions or flee before it. We see the birds gradually pushed to the southward, encroaching upon those already there. We understand the crowding that ensued and how these birds spread northward again as the glaciers receded, only to be forced back once more with the coming of winter. Then, with the withdrawal of the ice and the evolution of the seasons, these migrations, by repetition through the ages, became permanent habits or instincts; and with the ensuing modifications in the contour of the continent, and the changes in the location of the food supply, many variations developed in the migration route of each species which seem inexplicable today.

We picture these things to ourselves; we understand a little better the great mystery of the bird's life, and perhaps we can appreciate somewhat more fully the presence in our thickets and gardens of these songsters, whose lives are ever one series of hardships and dangers, and yet which, withal, are so expressive of the happiness and joy to be derived from nature.

#### BLASTING AND TREE PLANTING

By F. W. WILSON

RECENTLY, nurserymen who make a specialty of shade and ornamental trees have been making experiments and a special study of transplanting large trees and they have been successful beyond anything that was ever dreamed of ten years ago. Nowadays a man can buy a suburban or a country property and have old shade on it within a few months after building his home.

Park Commissioners throughout the country have been especially interested in these experiments with the transplanting of old shade trees. It has been a serious matter until recently to have a beautiful old tree in one of the city parks die. It was regarded almost a national calamity when the old elms in Harvard yard at Cambridge, Mass., became diseased and died. A wealthy Harvard Alumnus has recently agreed to provide the money to replace these old elms.

The planting of a large old shade tree is not the simple matter, however, that is the planting of a young year or two old seedling direct from the nursery. It is con-

sidered an art to be able to transplant one of these large old trees and have it grow and thrive.

G. W. Sherman, a Park Commissioner of Breckenridge, Mo., has been carrying on some interesting experiments in transplanting of old shade trees in the Breckenridge Park. The accompanying pictures were taken by him. One shows an old dead tree being blasted out with



THE OLD TREE AND THE NEW

After the old dead tree had been easily removed by dynamite the tree seen on the right was planted, the hole being large enough to accommodate its extensive root area.

dynamite. A number of these trees ranging in size from 12 to 18 inches in diameter were disposed of in this way. The other picture shows a tree about 24 feet high that was planted in the same hole out of which the old dead tree was lifted.

Mr. Sherman is very enthusiastic over this method of planting. The hole made by the explosion is large enough to accommodate the new tree and gives the latter an exceptional chance to grow rapidly and thrive well because the blasting breaks up and pulverizes the soil within a radius of several feet, making it easy for the newly transplanted tree to throw out its new rootlets and feeders and making available plenty of moisture and plant food to give the new tree a good start and ample sustenance to insure its steady growth.

# Tree Bark as Human Food

BY HU MAXWELL.

WHEN the many kinds and great numbers of trees constituting the American forests are considered, it is remarkable that the bark of so few of them is of value as human food. Many an excellent woodsman has starved to death in the forest because he could not find in the bark of trees the means of sustaining life. Nuts and other fruits in season supply food; and many herbs possess edible roots which Indians and frontiersmen of early days knew how to prepare and use as food; but the bark of trees was usually of no avail as a means of preserving human life in time of famine.



WESTERN YELLOW PINE BARK AS FOOD

These trees are in the State of Washington. It was in this region in 1805 that Lewis and Clark first recorded the fact that Indians used this tree's bark for food. The bark has been so used, in a small way, over an area of nearly a million square miles.

That, however, has not been the popular belief. It is quite commonly supposed that in the days of the pioneers when forests were everywhere, that the hunter or traveler who knew the woods was able to peel a tree trunk, skin out the soft inner bark and make a tolerable meal of it and thus appease hunger and sustain life in times of adversity. That did sometimes happen under certain conditions; but it was unusual. Some theorists who know very little of woodcraft and of the real resources of the primeval forests, have lately amused the public by writing articles pretending to point out how a man can go into the forest and without clothes, food or shelter, remain indefinitely without assistance other than that found naturally in the forest.

Such a thing may be possible, but it is barely probable and then only under favorable circumstances. In summer when fruit is ripe and the weather is warm it is more nearly possible than in winter or when conditions are not the best. At any rate, the bark of trees could be depended upon to a very limited extent only to supply food.

No fact of forest history is better known than that the Indians often died of hunger in the primeval wilderness. They knew the trees well and were acquainted with the food value of all the nuts, buds, roots, and bark that existed in the regions over which they ranged, and yet large numbers sometimes perished of sheer hunger. It is true that life was often prolonged or saved by a bark diet, but evidently it was not always possible to do so. Much depended upon the region, the season of the year, and the kind of trees within reach.

Much light is thrown on this matter in a series of books known as the "Jesuit Relations," consisting of some



INDIANS ATE WESTERN RED CEDAR

Formerly Indians of the Northwestern Pacific Coast made much use of the soft inner bark of this cedar as an absorbent of fish oil and bear fat, and ate the mixture, which they said was palatable. The custom, however, no longer exists.

eighty volumes, made up chiefly of letters and reports by French missionaries among the Indians of Canada, the Great Lakes region, and the upper Mississippi valley. The period embraced about 150 years, dating from 1630. Starvation was one of the common matters discussed by those missionaries who lived with the Indians and shared their sufferings; yet hardly ever was bark referred to as an article of diet, though the famine might be appalling, and though almost every possible food resource was tried by the starving people in seasons of sore distress.

One of the few allusions to bark eating in all the voluminous correspondence of the Jesuits in America is here quoted, in translation from the French. It occurs in a letter written by Louys Andre in 1670, from the vicinity of Lake Nippissing, Ontario. In volume 55, page 135, he writes:

"All of these poor people have for some time been suffering from a famine, and I found them reduced to a fir tree diet. I never would have believed that the inner bark of that tree could serve as food, but the savages told me that they liked it. I know not whether it would always be so, but I do know very well that, when hunger forced me to seek some sort of food to keep me from dying, I could not swallow fir bark. I did, indeed, eat some bark of another tree, and hunger made me find therein the taste of bread and the substantial quality of fish."

The precise tree species here spoken of is not certain, the French word "sapin" has been translated "fir tree." It was probably the balsam fir (*Abies balsamea*), but possibly the hemlock (*Tsuga canadensis*) was meant.

The soft inner bark and the adjacent layer of jelly-like new wood of many trees are not offensive to the taste and possess some food value, but this material is procurable only in late spring and early summer, for it is at that season that active growth is taking place. Later in the season this new material hardens into wood and is then difficult to chew and is apt to be offensive to the taste. At the time of year when this growing inner bark is at its best, there are other foods in the forest, and hunger can be appeased by them. If this growing layer of wood and bark were available in winter, when nearly all other eatable things are lacking, it would no doubt

have been eaten much oftener by the Indians and other hunters. It is often eaten at the present time, not from necessity but from choice. That is true particularly of the bark of the sweet birch in eastern forests and of the yellow pine in the forests of the western country.

The writer of this once happened upon a camp of Mono Indians on the headwaters of Finegold River among the

Sierra Nevadas, and found them feasting in great hilarity upon the inner bark of the western yellow pine (*Pinus ponderosa*) which they had peeled from the trunks of the neighboring trees. That was in the spring when the young bark was forming. I sampled the uncooked bark and the taste was not bad; but no trial was made of the boiled product, because the culinary practice of the Indians was not appetizing. Those people were not driven to bark-eating by famine, but were doing it because they liked the taste. A deer they had killed that morning was hanging unskinned on the limb of a tree in camp. It may be mentioned incidentally that one of the Indians who seemed to find special pleasure in the pine bark soup took pains to tell me that he could "sing" in Latin, and to prove it he recited an extract from Virgil's *Aeneid* in the original tongue. He said he could "sing the whole business." Possibly he might have done so, for he seemed to get along nicely with the dozen or so lines, which he chanted for the edification of the visitor.

I was told that he had been educated for a Catholic priest, but he had failed to make good, chiefly because of an appetite

#### SLIPPERY ELM IS WELL LIKED

The thick, soft inner bark will allay hunger, but it is believed to have very low food value for human beings, though the lives of horses may be sustained by it. Children chew the bark for the same reason that induces them to chew gum.

for liquids stronger than pine bark soup.

The use of yellow pine bark by Indians seems to have been of long standing, and was not and is not confined to any locality or region. The habit has had a wide geographical range. It was mentioned in the journals of Lewis and Clark during their expedition across the continent in 1804-1806. In speaking of a locality near the head of the Missouri River in what is now western Montana the journals say:

"We saw where the natives had peeled the bark of the pine trees about the same season (spring). This the Indian woman with us informed us that they do to obtain the sap and the soft part of the wood and bark for food."

The custom of eating this pine's bark was referred to



later in the journals of the expedition. The region was the western part of the present State of Washington.

Government agents nearly a hundred years later reported that the bark-eating Indians in the State of Oregon were injuring the pine forests. The report was by John B. Liebig and may be found in the United States Geological Survey's twenty-first annual report, part V, page 290, as follows:

"The custom of the Indians of peeling the yellow pine at certain seasons of the year to obtain the cambium layer which they use for food, is in some localities a fruitful contributory cause toward the destruction of the yellow pine by fire. They do not carry the peeling process far enough to girdle the trees, but they remove a large enough piece of bark to make a gaping wound which never heals over and which furnishes an excellent entrance to fire. Throughout the forests on the Klamath Reservation trees barked in that manner are very common. Along the eastern region of Klamath marsh they are found by the thousand."

The bark of another far western tree has long served the Indians as food, but it does not appear that white men have ever been forced to use that resource to preserve life. It is the gigantic western cedar (*Thuja plicata*), often known as the shingle cedar, because most of the shingles used in the United States and Canada are made of this wood. Indians inhabiting this tree's range, from Oregon to Alaska, make use of the wood and bark for various purposes. Most of the huge totem poles which stand like sentinels at the doors of wigwams, or on hills overlooking villages, are carved from the trunk of this tree. The largest canoes in the world have been hewed from the enormous boles of this cedar; and the Indians' dishes, platters, troughs, and their grinning clawed, and fanged graven images of idolatry are carved from the soft wood of this gigantic coniferous tree. The bark is as useful as the wood. Its long, tough fibers are spun into threads and woven into mats for beds, blankets, and portieres for wigwam doors; ropes for manufacturing dog-harness, and lines with which to haul canoes up rapids of rivers on the native's long journeys. But the uses of the bark does not stop there. It is pounded in wooden mortars until reduced to pulp, is then mixed with as much whale oil, fish oil, or bear grease as it will absorb, and is then kneaded into loaves, cakes, and cookies, which are baked

in ashes of the camp fire and become bread. It is said to be palatable and nourishing, but it is probable that the nourishing property is due more to the grease and oil than to the bark. At any rate, the Indians of Vancouver, Queen Charlotte, and other islands, and on the mainland of British Columbia, like it and seem to flourish on the diet. In color the cedar bark bread resembles a chocolate cake; but it is tough and it requires the strong jaws of an Indian to negotiate it, and it may be supposed that as a regular diet it would not suit the stomach of a dyspeptic person.

The slippery elm tree (*Ulmus pubescens*) grows throughout the eastern half of the United States. Its inner bark consists of a thick, soft, brittle mucilaginous layer. It is quite distinct from the cambium layer, which is the spring growth of new wood and bark. In that respect it differs from most of the other barks used for human food. The elm's edible bark may be taken off either winter or summer. Its character is little influenced by the season of the year. Physicians have always used it for medicine and poultices. And old-time medical book declared that elm bark was worth its weight in gold, because it is a life saver when employed as medicine. It may not be esteemed as highly now as formerly, yet all drug stores keep it for sale. Perhaps more slippery elm bark is sold for medicinal purposes than any other bark native to the United States; certainly more of it is eaten than of any other.

It does not rate high as a food. In fact, analysis shows that the bark contains very little that can be classed as human food. Records of lives saved from starvation by elm bark are few and doubtful. Yet it is habitually eaten in all regions where it grows. It is difficult to find slippery elm trees in the vicinity of towns, for the reason that children single them out and peel them of their bark which they chew for the same reason that they chew gum—not for food but as a habit. It has no more taste than remains with gum after the flavoring has disappeared; yet it satisfies the desire of the jaws to be chewing something. The bark is usually swallowed, and seemingly it does little good or harm, although it is indigestible.

Horses may be kept alive and in fairly fit condition on an elm bark ration, as was demonstrated in the war of 1812 during the Lake Erie campaign; but when men try



SWEET BIRCH IS TASTY

The inner bark or cambium layer of this birch is pleasant to the taste in early summer, and peeled trees in many parts of the range of the tree betray the extent of its use as food. Children are the greatest eaters. The tender bark of twigs is also gnawed and eaten.

to live on it they rapidly lose strength. It appeases hunger but does not repair the waste of the body.

The native tree bark most pleasing to the taste is that of sweet birch (*Betula lenta*), which is one of the birches whose woods contribute lumber for doors, furniture, and interior house finish. The tree ranges from Newfoundland to Minnesota, and southward along the Appalachian Mountains to Georgia and westward to Illinois and central Tennessee. This is the birch from which the "oil of wintergreen" is usually made by the distillation of the wood and bark of small trees.

Early in summer the new growth beneath the bark is of considerable thickness and is rich and starchy, with a pleasant taste. Trunks may then be peeled and the edible portion may be scraped from the underside of the bark. It needs no cooking or other preparation but is eaten raw, and hunger is satisfied. It is at its best only during a few weeks in early summer. After that, the edible portion becomes woody.

The food value of birch bark seems to be well established, but it is not known how long it is capable of sustaining human life in the absence of all other food. During the Civil War it was, on one occasion, put to a severe test. It was during the campaign in what is now West Virginia by Gen. McClellan in 1861. At the battle of Carracks' ford, where the town of Parsons now stands, several companies of Confederate troops from Georgia were cut off from the rear of Gen. Garnett's retreating army, and fled into uninhabited mountains. Several hundred of these soldiers, who were already in a famishing condition, escaped through a pathless wilderness, across Tucker, Randolph, Pendleton, and Highland Counties, with practically nothing to eat except birch bark. It was in early summer. Not a man starved to death during the long retreat through the forest. Many years afterwards the writer of this was able to follow the route of the retreat by noting the peeled trunks of birch trees from which the soldiers had secured the bark for food.

#### CORRESPONDENCE COURSE IN LUMBERING

THE correspondence course in lumbering which is being offered by the State College of Forestry at Syracuse through its forest extension service is attracting wide attention in New York State. Already a number of men have enrolled, and it is believed that this taking of instruction out into the State to those who are handling or using lumber and other products of the forest will mean much in developing more extensive utilization of forest products now wasted. The course is open to any man or woman in the State, and one may enroll at any time.

#### GEORGE WASHINGTON PROFILE.

THE Natural Bridge of Virginia was one of the earliest discovered natural curiosities of America, but it was only a few years ago that in the aperture beneath the bridge there was seen to be a huge, distinct profile, assuredly the head of George Washing-

ton. At least the profile is that of a man and moreover it is that of a patrician with a prominent, slightly aquiline nose and good forehead. It will be seen by examination of the photograph that the nose and mouth are formed by the projection of small bushes from the side of the bridge and it may be considered quite probable that prior



Photograph by Dr. Charles D. Walcott.

#### PROFILE OF GEORGE WASHINGTON

Natural rock heads and faces are not uncommon, but a profile due to the absence of rocks is unusual. This is looking through the gorge of the Natural Bridge of Virginia, and the profile is that of George Washington. The nose and mouth are outlined by the bushes.

to the signing of the Declaration of Independence the verdure of this side of the gorge grew in such a manner as to cause the face to have no resemblance whatever to the Father of his Country. But few people know of this profile today, and of those who do, some have tried in vain to get into proper position to show it up for photographing. The present photograph was taken by Dr. Charles D. Walcott, when Director of the United States Geological Survey.

# A Private Forestry Undertaking

By A. F. HAWES, *State Forester of Vermont*

IN the summer of 1909 the newly created Vermont Forestry Department made a working plan of a tract belonging to Dr. Wm. Stanford Stevens in Enosburg, Vermont. Since that time the owner of this nine hundred acre tract has consistently followed out the recommen-



NATURAL MAPLE REPRODUCTION

A sugar orchard from which the poorer trees have been cut in order to permit natural maple reproduction.

dations of this plan. As Dr. Stevens lives on the place only a portion of the year he was unable to give it the attention necessary to make it successful as a dairy proposition. The plan, therefore, contemplated the discontinuance of active farming by the owner. He has continued to sell his hay from the mowings, and by the application of commercial fertilizers has aimed to keep up their fertility. The pastures were all in bad condition owing to the fact that fully half their area was taken up with ferns, which could not be eradicated without the expenditure of considerable money.

The chief expense called for in the working plan was for the reforestation of these run-out pastures. About one-third of the area was typical northern hardwood forest, and part of it had been used as a sugar orchard as a large part of the trees were maple. These were badly infested with the borer. There were also a great many dead and down trees, and a good many large mature hemlock, that were ready to cut. The plan outlined systematic reproduction cutting throughout the wooded portions, with a view towards securing natural reproduction of sugar maple, white ash, basswood and yellow birch.

During the six seasons which have followed the making of this plan, Dr. Stevens has planted 262,000 trees, including 25,000 used for filling in vacant places, covering about two hundred acres. There still remain 144 acres of pasture to plant, and this will be completed at the rate of 50,000 trees a year. The total cost of the planting thus far completed is \$2,282.42, or an average of \$9.22 per thousand for those now living. Practically all of these trees have been purchased from the State Nursery.

The species used are: White pine, 237,000; Norway pine, 12,000; Norway spruce, 13,000; making a total of 262,000 trees.

With the exception of the trees planted in 1911, a very dry season, most of them have lived and are now making a rapid growth. In fact the planting is such a



SCOTCH PINE PLANTATION

Four years ago Scotch pine seedlings were planted here and the vigorous growth they have attained is evident.

success that the owner is now contemplating the reforesting of the poorer meadows.

The material removed in the reproduction cuttings has sold for more than enough to cover the cost of cutting. The total sales of wood and lumber have amounted to \$3,239.54, while the cost of getting out this material was \$1,357.75, leaving a profit on the operation of \$1,881.79. The appearance of the woods has been much improved thereby and reproduction, especially of maple, has followed in a very satisfactory degree.



COWS PREVENT MAPLE REPRODUCTION

The effect of permitting cows to graze on this character of land is evident. Maple reproduction has been prevented.

To summarize the results of the six years' work it may be said that about three-quarters of the woodland has been improved and 200 acres of nearly worthless land have been reforested, and thereby made productive. When the provisions of the present working plan are completed, a revised plan will be made for another ten-year period. The financial summary for the first six years is as follows:

Cost of cutting .....	\$1,351.75
Cost of planting .....	2,282.42
Expert assistance .....	103.76
Total cost of operations .....	\$3,743.93
Total receipts .....	3,239.54
Net cost of all improvements .....	\$504.39



NO COWS ALLOWED HERE

From this orchard the cows have been excluded and as a result there is a vigorous reproduction of maple.

Yield tables are not available to estimate the future value of the hardwood forest, but it is safe to estimate that it will be worth considerably more in twenty years than it would have been, had it been left to itself, and the revenue has been used to reduce the carrying charges on the plantations.

It is safe to estimate that the plantations when forty years old will be worth \$250 an acre. Considerably higher prices have been paid for pine plantations of this age. Two hundred acres at this price will be worth \$50,000. An investment of \$504 for forty years at 5 per cent amounts to \$3,548. Leaving taxes out of consideration, therefore, the profit on the operations thus far undertaken should be about \$46,000, over and above 5 per cent compound interest on the investment.

#### FIRE WARDEN'S MEETING

THE Fire Wardens of Monroe County, Pa., held their third annual meeting at Pocono Manor recently on invitation of Edwin A. Hoopes, president of the Pocono Protective Fire Association. The State Department of Forestry was represented by Chief Forest Fire Warden George H. Wirt and District Forester John L. Strobeck. These annual meetings are regarded by the Department of Forestry as very important aids to an effective fire service. They bring the men together in a social way that develops comradeship, and, besides, they furnish opportunity for instruction in the duties of fire wardens. The idea of an annual meeting and dinner originated with the Pocono Protective Fire Association. Its results have been found to be so satisfactory that wardens' annual meetings are now required by the department in each Pennsylvania county where forest fire service under the new law has been organized.

#### WHAT SAWMILLS WASTE

THE waste product of sawmills in the United States including that fed to the furnaces as fuel is estimated to be 36,000,000 cords per year, and the equivalent of 2,880,000,000 cubic feet of solid wood substance. About half of it has no use whatever, but is usually burned to get rid of it.

#### DRYING LONG-LEAF PINE

IMPORTANT laboratory experiments at the Federal Forest Products Laboratory at Madison, Wis., are being followed by practical commercial experimenting in the Louisiana field, by members of the federal staff, on the saving of time in drying long-leaf pine. No report can be made on these experiments as yet, but it is understood that the experimenters demonstrated a commercial saving of about 20 per cent in the new method of drying the southern pine. As successful in the laboratory, the time of drying is cut from forty-eight hours, the old time, to thirty-nine hours, about 20 per cent, meaning that much saving in the operation of the kilns. Following the laboratory experiments, the experimenters are now trying out the new method commercially for the Tremont Lumber Company, at Winfield, Louisiana.

# The Conifers Curse

BY R. E. TAFT.

ONE pleasant day in June, a matter of twenty years ago, a party of sightseers were strolling through a dense forest of spruce and pine in the Rocky Mountains. A young man suddenly stopped, set his foot on a decaying log and delivered a few ill-chosen and evidently hasty remarks.

A "splinter" had penetrated the toe of his shoe and caused some inconvenience to one of his pedal extremities incased therein.

The writer, with an accumulated mountaineering experience of fifteen years, was prepared for such emergencies, and with a small pair of steel pincers soon removed the "splinter," which proved to be a porcupine's quill.

While this "surgical operation" was in progress a little girl, with curiosity and sympathy equally divided, came rushing down the mountainside. An unnoticed bush caught her feet and sent her headlong upon the ground. Scream upon scream of agony rent the atmosphere and the writer's pincers were again called into action to extract two porcupine quills from the palm of one hand and a dozen more from her body and clothing.

Five years previous to this time a hunter had emptied both barrels of a shotgun into a belated porcupine.

As time passed, his adamantine and seemingly imperishable barbs had become scattered over about ten square rods of ground, to the inconveniences and results aforesaid.

A few minutes later the party came upon a huge spruce tree with a large section of the trunk near the ground showing clear and white in the rays of sunlight that shot through an open space in the forest.

The porcupine that had chosen the inner bark of the tree for his midday lunch stopped his work to gaze with apparent wonder at the intrusion upon his domain.

A well-directed pistol shot put an end to his depredations.

The death-dealt tree was one of hundreds noted in the course of the day that brought from one of the company the query of, "What is a porcupine good for?" In the good old orthodox days the inquiry would have been dismissed with the simple statement that all things were created for a beneficent purpose; that the purpose became apparent upon close investigation. The close investigations of those days brought the conclusions that the fly was a scavenger that preyed upon and destroyed disease-breeding filth—that the mosquito removed bodily impurities that lodged near the human epidermis.

The science of the day has upset and revised those old theories and a war of extermination is now being waged upon those pests.

An acquaintance with and study of the habits of the porcupine, extending over a generation of time, has convinced the writer that this rodent has not one redeeming trait, nor can a good reason be given why he should be permitted to exist. Like his brethren, the gopher, the rat and the mouse, he should be billed for extermination.

In furtherance of this belief I began a warfare upon the species with gun, pistol and trap and found at the end of a dozen years that no inroads had been made upon the number in my vicinity.

Every day or two I would find a tree girdled near the ground or denuded of bark to the top. In one instance I measured off a block of ground 50 by 100 feet and found forty-two out of fifty-seven trees therein destroyed by porcupines. Their nocturnal habits made it out of the question to rid a neighborhood of them by shooting, while traps can only be used at the entrance of their dens. There are but two months in the year (May and June) that they are found at large in daylight, and dens are used only while breeding or during cold weather. In summer their nights are spent in foraging and with the approach of daylight they take refuge under a log, rock, clump

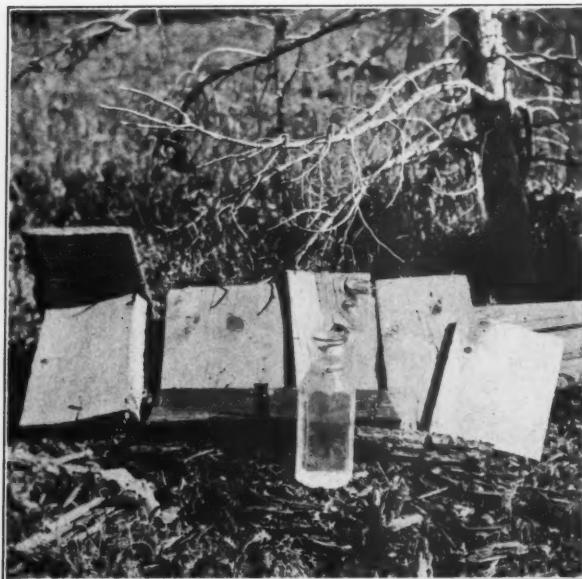


HOW PORCUPINES KILL TREES

They eat the bark, girdling the tree near the ground, or climbing the tree and stripping the more tender bark from the top. In one tract the author found forty-two out of fifty-seven trees destroyed by porcupines.

of sage brush or grass for the day. In the latter retreat they are a constant menace to stock.

A frequent sight in our mountain grazing areas is a cow or steer with nose fairly bristling with quills, due to the animal having suddenly thrown its head down into



POISON BOARDS FOR PORCUPINES

Porcupines love salty things and finding something saline in a newly painted board chewed the board. This gave the author an idea and soaking boards in brine he sprinkled them with strychnine, placed them in the forest and killed many porcupines.

a clump of grass or bushes only to land upon the barked back of a slumbering porcupine.

Nor is this all—the animal is extravagantly fond of salt. Anything containing the slightest taint of salinity is food for his teeth. A prospector's tool handles, ropes, ore buckets, etc., are speedily gnawed to pieces, while the homes of all mountain residents are rarely free from their nightly maraudings from spring till fall. For years the writer obtained some relief from their depredations by the use of a shot gun or six-shooter at all times of night, but the annoying destruction to buggies, sleighs, boxes, barrels, etc., went on, and the work of burning their bodies and clearing the premises of quills was still more exasperating—for when a porcupine is shot or struck with a missile or club the quills fly in all directions—a fact that probably gave rise to the story of our grandfathers that a porcupine possessed the power to throw his quills at an approaching enemy.

Five years ago the writer moved into a newly completed house, but the quiet of night was soon disturbed by the grind and rasp of a porcupine's teeth. I found that one of them had discovered something saline in the paint on a veranda railing. This gave me an idea and I carried it out in the way shown in the photograph. A quart bottle was filled with strong brine and a set of boards was thoroughly soaked with it. While still damp, strychnine was liberally sprinkled over them. (The photo shows the boards, brine and one ounce of strychnine bottles, also a small tree girdled and killed by porcupines.) These

boards were distributed in two square miles of forest area and had the effect of completely ridding a half township of the pests.

Some of these poisoned boards were placed in their winter dens; others were nailed to trees above the reach of horses or cattle or under trees whose low lying limbs prevented stock from getting to them, while others were fenced in. The poisoned faces of those used in small tree areas were protected from rains and wet snow by boards nailed across the tops.

The dead porcupine at the foot of the large tree was the third destroyed during May, 1910, at an expense of about one inch eaten from the side of the board. The tree was debarked by the rodents three years previously. It was the only instance where one of them was found near the boards.

Porcupines are very tenacious of life, but it can be taken as a certainty that when their teeth marks are found on the boards a dead pest will be found in the vicinity.

Complaints of the destructive work of these animals are heard from all sections of our country where conifers grow. I have read of instances where tree owners were paying \$1.00 for each porcupine killed on their grounds.

The method I have used will quickly and cheaply put an end to their work, and I would not have given it to the public had I not reached the belief that this most repulsive



THE PORCUPINE

One of the many which the author killed by poisoning, strychnine being placed upon the board nailed to the tree. Note how the bark has been stripped from the tree by the animals.

of all animals should be condemned as a nuisance and its ravages minimized, if he is not entirely exterminated. This can be done by concerted action on the part of private owners, the special agents and forestry officials in charge of the public domain.

#### NATIONAL FORESTS' TIMBER

**O**F the 688,922,000 board feet of timber cut on the National Forests during the fiscal year ended June 30, 1915, according to statistics just compiled by the United States Forest Service, 123,168,000 feet was taken under free-use permits given to settlers and others living in or near National Forests. There were 40,000 free-use permits, and the value of the timber they cut was \$206,464.13.

The remainder, or 565,745,000 board feet, was cut under sales contracts, for the most part with lumber operators, but including 19,246,000 feet sold at cost to farmers and settlers, as required by a special provision of the law. The prices received for all sold timber varied from 50 cents to \$5 per thousand feet, and the total value was \$1,179,448.39.

#### EXPERIMENTAL NUT ORCHARD

**T**HE New York State College of Forestry is planting an experimental and demonstration nut orchard on its Chittenango Forest Experimental Station. English walnuts, Paragon chestnuts, pecans and Hardy almonds in different varieties, also hazelnuts and filberts, will be tested for hardiness, growth and adaptability to New York conditions and bearing proclivities. The English walnuts secured from the Jones Nurseries at Lancaster, Pa., and planted last season, have grown vigorously, the seedlings having attained a height of 27 inches. The fact that these seedlings have come through the winter in perfect condition is very gratifying and shows the possibilities of nut culture throughout this region.

#### HUGE DOME OF GRANITE

By GUY E. MITCHELL.

**O**NE of the most remarkable masses of solid granite in the world is the huge bare dome surmounting a high mountain of the same imperishable rock. The mountain itself rises very steeply from the almost flat floor of the Yosemite Valley and the view shown in the photograph is an unusual one of the rear of "Half Dome" taken from the crest of the beautiful Nevada Falls. The hugeness of this dome may be better appreciated when you know that the tiny looking trees at its base near the arrow, are big pines over 100 feet high. Straight up from the arrow to the top of the dome the distance is 1,400 feet. The other side of the granite dome is a sheer perpendicular face of 2,000 feet. Incredible as it appears, it is possible for a good mountain climber to scale this dome and crawling to the edge to look over and even drop a stone straight down over a third of a mile before it will strike. The remaining 2,500 feet to the bottom of the valley is only a little less sheer, and

objects in the valley 4,500 feet below, such as horses and people, appear smaller than ants. Only those with well seasoned nerves dare approach the edge of this half dome without being fast tied with ropes. The great rock is of course immovable, but with most people there is a vivid impression that it is falling, and a strong tendency to become panic stricken and pitch over the edge to ter-



HALF DOME, YOSEMITE VALLEY

Rear view of Half Dome, Yosemite Valley, Cal. A great granite mass which overlooks the Valley from an altitude of 4,756 feet above its floor.

rible destruction. The great granite sentinel must have been shorn apart by some mighty cataclysm in past ages.

Half Dome is the commanding feature of the upper end of the Yosemite Valley with Tenaya Creek passing by one side of it and the Merced River on the other, uniting in the main Yosemite Valley.

#### DAMAGE BY WILD ANIMALS

**T**HE annual losses of live stock on the National Forest ranges of the West due to predatory animals are over \$500,000. An organized campaign is now going on to exterminate these animals. Wolves are responsible for about 70 per cent of the cattle losses, while bears cause most of the remainder. Approximately 75 per cent of the sheep losses are due to coyotes, 20 per cent to bears, and 5 per cent to lynxes and wild cats. Mountain lions are charged with killing only a few head of cattle and sheep.



Photograph by R. S. Maddox.

#### FEARFUL WASTE FROM EROSION

Showing how millions of cubic yards of rich agricultural soil have been washed away by erosion and have become a menace to bottomland fields, streams and the Mississippi River. The planting of trees and grasses has proven a very practical and effective means of stopping gullies. All of these thrive when planted on "made land" if they get the proper protection.

## Fighting Gully Erosion

By W. R. MATTOON, *State Forest Examiner*

DURING the last few years both public and private interests have become very active in efforts to check extensive soil erosion in western Tennessee. The State Government, the industrial departments of at least two large railroads, many private owners, and the U. S. Department of Agriculture, through the County Agents connected with the States Relations Service, are all engaged in this work. The situation has been brought to the serious attention of the public by the widespread depreciation in value of farm lands amounting in the aggregate to many millions of dollars.

The very deep, mellow, siliceous loam of the Lafayette, or "orange sand," formation which spreads widely over west Tennessee is easily workable and for the same causes very susceptible to erosion and transportation by water. In good agricultural practice, constant care is required on slopes to plow, cultivate, and sometimes terrace parallel with the contour lines in order to stop incipient gullies that may start. The general surface of the region is gently undulating, rising gradually eastward in a plateau slope to the ridge near the Tennessee River where it becomes broken. The region includes most of the State west of the Tennessee River, an area about 60 miles in width by 100 miles in length extending in a north and south line across the State.

In about eight counties, nearly every farm contains portions of land lying waste because of gullies, and there are many large tracts each covering several hundred acres in area that have been abandoned for the same cause. The character of these is shown in the accompanying illustrations. The result is a sparse population of an unprogressive class and a general depreciation in all property values in a region where the soil is capable of being maintained in a highly productive state. Mr. R. S. Maddox, Forester, State Geological Survey, Nashville, who has devoted most of his time during the past two years to gully reclamation work, estimates the area of land thus affected at not less than 230,000 acres.<sup>1</sup> Gullies usually are from 15 to 25 feet deep. At La Grange, Fayette County, gullies of immense size, 70 to 100 feet in depth, have encroached to the very edge of the town center, and the main highway leading south is retained only at high expense of grading, filling and concrete work.

The pernicious, long-standing habit of "clearing up," "working out," and "turning out," or abandoning, pieces of land as soon as they lose their natural fertility is unquestionably the underlying direct cause for the present situation. The birth of gullies usually takes place in cultivated fields where they might have been easily put out of the way by a little timely attention. They increase

<sup>1</sup>"The Resources of Tennessee," January, 1915, p. 13.

with astonishing rapidity, and soon outgrow the fields where they started, invading adjacent territory. An accompanying photograph shows a main public road retreating before the advance of a large gully. Many of the present larger gullies no doubt started during the "trouble in the sixties," continuing afterward when there was neither money nor labor for improvement. Prior to that time for about ten years under the leadership of several public spirited Tennesseans, the people began to study out and apply the best methods of "preventing their lands from running away."<sup>2</sup>

The planting of trees and grasses has proven a very practical and effective means of stopping gullies. Black locust, yellow poplar, ash, red oak, black walnut, catalpa, cottonwood, and other trees, also bermuda grass, when started on "made land" in gullies, all thrive under the



PLANTING NECESSARY HERE

This farm gully was planted with 12-inch black locust seedlings at the rate of about 1,200 per acre, and within a year they had grown to a height of 4 feet. In seven years the gully slope was completely reclaimed by the black locust trees.

protection afforded. Preparatory steps to planting consist of constructing compact brush dams across narrow places in the gully, thus securing "made land," and in grading down by hand or team sufficient loose soil to enable the young sapling to secure a foothold. Many of the woodlots in the region have been reduced to cull trees only, and since they exist on good agricultural land are more than likely to be cleared. The best policy for the future would be to convert the larger gullies into farm woodlots by the methods suggested, serving the double purpose of checking further destruction of land and growing a supply of farm timber on the least valuable part of the farm.



APPROACHING THE HOME

At the present rate of progress made by this gully, the home buildings of the owner of the farm will be engulfed within a few years.



ENGULFING A COUNTRY ROAD

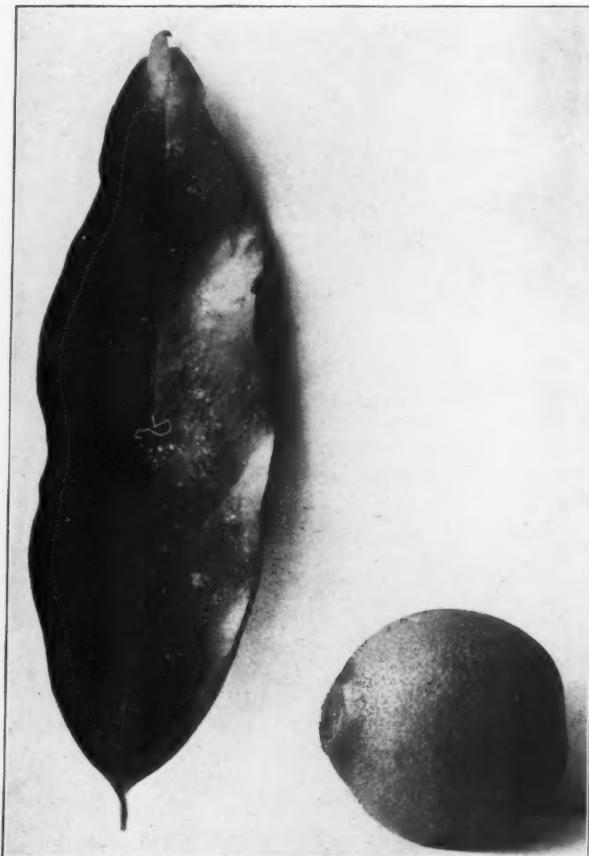
An expensive gully which year by year approached a country road which has several times had to retreat before it and now runs in almost a half-circle around it.

<sup>2</sup>Bulletin, University of Tennessee Agricultural Experiment Station, vol. 8, No. 3, page 107.

# The Greenheart of Commerce

By C. D. MELL

THE wood known to the trade as greenheart or bibiru is produced by a massive tree growing in the Suianas and in parts of Venezuela in South America. It is called greenheart because the heartwood of this tree is yellowish-green. It is highly esteemed for its usefulness in marine construction and other work requiring a strong and durable wood.



LEAF AND FRUIT OF THE GREENHEART TREE

The leaves remotely resemble the tupelo, but are larger, being from 6 to 8 inches long and 2 to 3 inches wide. The fruit, like a large walnut, when ripe falls to the ground, soon germinates and sends down a stout tap root. The young tree grows rapidly at first.

The greenheart tree is easily recognized in the forest by its long, clean and cylindrical bole and its light gray, thin, flaky bark, which contrasts very strongly with that of its associates. It ranges from 60 to 120 feet in height, and from 2 to 4 feet in diameter. Chief among the trees which in height and circumference vie with greenheart are the mora and the West Indian locust. Mora is a tree which grows to an enormous size, frequently attaining a height of 100 to 150 feet—sometimes it reaches a height of nearly 200 feet, but when it is as large as

this the tree generally has a hollow trunk at the base. The West Indian locust usually grows very tall and produces a trunk that is without branches for more than 80 feet.

The stems of greenheart are often without branches for more than three-fourths of their total height, and are usually cylindrical to the first branches for 50 to 90 feet, and logs from 12 to 24 inches square can be obtained. A number of logs 70 feet long and 14 inches square are shipped to the English markets. Logs 85 feet long, 14 inches square and perfectly straight, are occasionally met with. The crowns in old, mature trees are usually open, round and small, as compared with those of large trees of other species in the tropical forests. It has a few large branches at the base of the crown, which extend at right angles to the main axis; the upper branches are more ascending and are rather twisted and knotty.

The small branches are more erect and bear the leaves which are comparatively large and elongated, remotely resembling those of our tupelo, only they are larger, measuring from 6 to 8 inches in length and from 2 to 2 inches in width. They taper to an acute point at both ends, have a smooth glossy surface, a leathery appearance, especially when old, and are arranged alternately on the twig. The flowers are more or less inconspicuous in comparison with a good many other large tropical trees; they are at first greenish but later turn whitish or pinkish in hue. The fruit of greenheart is large, and in general outline favors a large walnut. Its thin pericarp is light brown in color, almost smooth, and encloses a single large seed.

When the fruit is ripe it falls to the ground and soon germinates, sending a stout taproot down through the leaf mold into the sandy or gravelly clay soil beneath; at the same time it develops a stem with large leaves which secure part of their nourishment from the large cotyledons in the seed during the first six or eight weeks of the life of the young plant. It makes a rapid growth at first, while the stored-up food in the seed lasts, but its struggle for existence becomes keen when this source of nourishment is exhausted.

The first year the seedling attains the height of about 12 inches and develops from 2 to 4 large leaves; the second year it shoots up to the height of 2 or 3 feet, after which it goes on increasing until it attains the height of about 20 feet, when its rate of growth in height and diameter decreases. It is during the first four or six years when the young greenheart trees are liable to suffocation from other more vigorous trees and shrubs. Only one out of hundreds of greenheart seedlings may grow up to become a tree. The old trees produce seeds every year, and practically all of them germinate.

nate, but one rarely sees greenheart saplings from 2 to 4 inches in diameter in the virgin forest.

Those who have lived among greenheart trees all their lives, and who have watched them grow from year to year have observed that the rate of growth of trees over 4 to 6 inches in diameter is exceedingly slow, and that it varies according to the locality and soil. It grows fastest in forests of deep, alluvial soil. Here the roots can spread far and find more nourishment than in the sandy clay region on the uplands. The rate of growth is so slow that the annual rings on a transverse section of a greenheart stem are not visible with a hand lens magnifying from 4 to 6 diameters, but from general observations it is known that even young trees on the hills and drier slopes with soil or with rock near the surface, grow very slowly. It is considered that at least 100 years are required for a greenheart tree to acquire a merchantable size, and a good many of the large trees that yield logs 24 inches square are doubtless over 300 years old. The period varies much, however, in different regions of its range of growth and also upon immediate environment of the individual trees.

Greenheart is known to occur in British, Dutch and French Guianas and in parts of eastern Venezuela. The reports that this tree is found in Brazil and in Colombia have not yet been authenticated, but it is quite likely that it grows in Brazilian Guianas near the mouth of the Amazon. It grows chiefly on the moist slopes and ridges where the tops are exposed to the rays of the sun. On the dry, exposed ridges as well as in the wet soil along the rivers, it becomes scarce or disappears altogether. In the regions where it occurs most abundantly, the soil is a sandy clay, or, in some localities, almost pure sand and gravel. A stiff clay soil with a sufficient amount of sand to render it loose is favorable to its complete development. In the lowlands where the soil consists of sand and loam, greenheart occurs less abundantly.

In its habits greenheart may be considered to be partly gregarious, for although it always grows more or less intermixed with other trees, it is generally confined to certain areas of rather limited extent. It may constitute the prevailing tree for a few hundred yards, but seldom

for a mile continuously. Such localities are the moist slopes that receive the moisture-laden air from the ocean, and it is here where it attains its best development from a commercial point of view. It is obvious that a tree depending on so many local peculiarities cannot occur continuously to any great extent. The Colonial Forest Office of British Guiana determined by actual count that on a sample area which contains greenheart in merchantable quantities, there were on an average about 150 timber trees to the acre, 32 of which were greenheart. About 73 per cent of the greenheart trees were found to range in circumference from 48 to 180 inches. Trees which will not square 10 inches are not permitted under the Crown Lands Regulations to be cut.

The quantity of greenheart in British Guiana has been, and still is, very great, although the lower forests have been heavily worked, and now the best greenheart is to be had only farther inland and in the less accessible places above the cataracts in the rivers. This observation



MADE OF GREENHEART

These large dock gates at Wallsend on Tyne, England, are made of greenheart timber imported from British Guiana especially for this purpose.

applies more particularly to the forests along the Demerara and Essequibo Rivers in British Guiana, though it obtains also in part to the regions in Dutch Guiana, where the rivers are not so long and present less formidable rocky impediments. The transporting facilities which the rivers in a country without railroads afford is very



HAULING GREENHEART LOGS

Large quantities of this wood have been regularly exported to Europe for over a hundred years. It is popular for permanent marine structures.

great, even from the extreme sources. The small tributaries are made passable by removing all the dead logs (locally called tacubas) which have accumulated for hundreds of years. In some instances it costs almost as much per mile to clean and straighten a creek in the interior as it would cost to grade for laying the ties and rails of a railroad. All the streams are meandering and in a good many places new channels have to be excavated in order to facilitate the carrying of logs. This frequently necessitates the removal of massive trees and old stumps before logs can be carried downstream, which is often done in less than 2 feet of water by chaining one or two logs on each side of a flat-bottom boat locally known as ballahoo.

Greenheart wood varies from a greenish-yellow color to dark or nearly black. The heartwood is always darker than the sapwood, though the latter becomes deeper in color upon exposure, and it is often difficult for the inexperienced man to distinguish the sapwood from the heartwood in the sawn condition. The color of the wood is due to the presence of a greenish color substance known as greenheartin. It is believed that its

extraordinary freedom from decay is due, at least in part, to the tyloses in the pores of the wood and probably also to the presence of the alkaloid biberine. Greenheart has no decided characteristic odor, even in the fresh state. This is contrary to expectation, because a great majority of the trees related to it have wood with very pronounced pungent or spicy taste and odor. The wood is very hard, heavy (about 70 pounds per cubic foot), very strong, though brittle, and exceedingly durable. It is probably the most durable wood known, and is especially valuable, therefore, in a climate like that of tropical America, where the elements favoring decay are so numerous and powerful. Greenheart in the unseasoned state is moderately easy to work, but after it is thoroughly dry it becomes so hard that sawing or nailing becomes difficult. It seasons rapidly and shrinks very little, and, being free from tannic acid, it does not injure iron to any appreciable extent.

Greenheart is said to be one of the strongest timbers in use, with a crushing strength of 12,000 pounds per square inch, 65 per cent greater than that of English oak. The shearing strength parallel to the grain is between 1,800 and 2,000 pounds per square inch. From all the records of tests made on greenheart it appears that it is superior to oak in all its properties, except perhaps in toughness. While the results of the mechanical tests made on greenheart vary considerably, the variation is



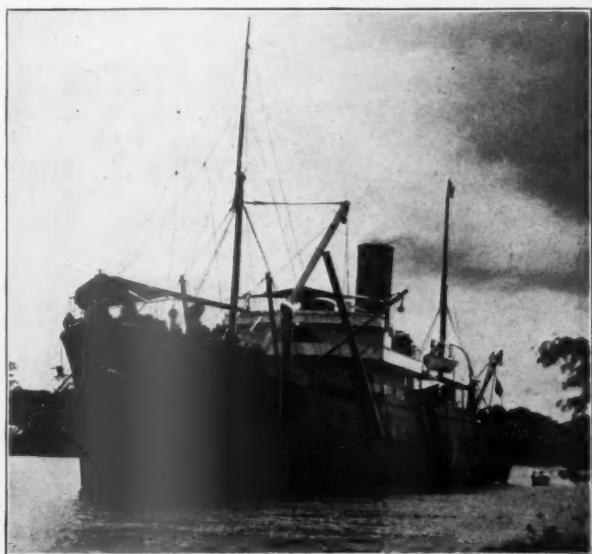
SNAKING GREENHEART LOGS BY GANGS OF MEN

not so great as in the case of our white oak, whose properties vary exceedingly according to the locality. Users of greenheart have frequently noticed that logs apparently sound lacked in strength and toughness, and that the darkest colored wood is the most durable. It does not vary so much in density and all of it is very fine-grained and takes a very fine polish. The bulk of the wood that comes to the market is straight-grained. Some of the old trees are curly-grained, locally known as "bull-

forehead," but the logs are frequently defective and the wood difficult to work. The logs are often slightly checked and partly rotten along the pith or center, but if the center is boxed it will not be considered a defect. It is not attacked by white ants in the tropics, and, from long experience, it is learned that the heartwood is proof against the attacks of all marine borers and is superior to every other wood, both in or out of the water.

Differences in quality according to soil, situation, and moisture are often observed. It is commonly claimed that the greenheart from the region along the Demerara River in British Guiana is superior to that from other regions, or that from the basin of the Essequibo surpasses the wood from all other sources. During the last year or two a great deal has been said and written in favor of the greenheart from Dutch Guiana, indicating that it is of greater strength and endurance than that from British Guiana. For these distinctions there is evidently some foundation, but by no means to the extent alleged. There may be a few logs of greenheart from the Essequibo River region that are inferior in strength and compactness of grain and texture to the general run of logs from other sources, but this cannot be said as a general thing. It is true that greenheart obtained from the low, flat land is inferior in strength and durability to that from the moist slopes in the interior above the first cataracts. Indeed, the varying qualities of the greenheart from different regions have long been well known to practical men, but the Demerara and Essequibo greenheart has been generally esteemed the best and always pre-

years, and greenheart has since been the most popular wood for permanent marine structures where durability is highly desirable. Its value for marine works does not consist merely in its durability; another greater advantage is that the wood does not warp or twist after



FIFTY MILES UP RIVER LOADING GREENHEART

This steamer is up the Demerara River, British Guiana, loading greenheart for England. A great deal of the wood is taken out by water in this way.

it is thoroughly seasoned and put in place. A ship planked with greenheart is at all times ready for service, while boats constructed of most American woods often warp and require caulking. Rated as a first-class wood at Lloyds, it is used largely for all kinds of submerged work, such as wharves, piles, docks, and lock gates. It was used in the construction of Nansen's ship, the *Fram*, and the good ship *Discovery*, of Antarctic fame, was built of Demerara greenheart. The dock gates in the Mercy harbor and the lock gates of the Manchester Ship Canal were all built of this wood. The lock gates of the Panama Canal were in part constructed of greenheart from British Guiana, and it has been recommended for the fenders, miter posts, sills, and quoins of the dock gates at Balboa, and also for the keel blocks in these two dry docks. One of the earliest uses of greenheart in this country was for the manufacture of fishing rods, and it is still considered one of the best woods for this purpose.



GREENHEART LOGS AT WISMAR, BRITISH GUIANA

ferred by the English dock builders. The Dutch Guiana greenheart is not used extensively in England and America, and very little is known here in regard to its lasting and other qualities, but the wood has been used successfully in the Netherlands, and eventually will become an important article of export. The bulk of the wood that is now exported from Paramaribo is obtained from the lowlands, and is probably slightly inferior to that from the uplands in British Guiana.

In British Guiana greenheart is commercially the best known and most valuable wood. Large quantities have been regularly exported to Europe for over a hundred

#### MAKING MAPLE SUGAR

THE New York State College of Forestry is carrying out experiments in the manufacture of maple sugar on its Chittenango Forest Experiment Station. The conditions under which this experiment is being conducted will show, from a small number of trees, the return which can be anticipated from a farm woodlot. Very gratifying results have thus far been obtained and the experiment will be continued for three years more.

# THE CHILDREN'S DEPARTMENT

BY BRISTOW ADAMS

## FIRE IN THE WOODS



MAY day in 1903, a small boy in Hamilton County, New York, was sent out to find a cowbell which had been lost in the brush at the edge of the field in which the cow grazed during the summer.

This field also furnished a supply of hay to carry it over winter.

Hamilton County is covered almost entirely by the Adirondack Mountains, and is a succession of dense forests and beautiful lakes, with here and there a small farm clearing in between. On all of the maps issued by the Government to show by colors

To make the story short, the boy started a little fire, and before it was out there was no more use for the bell. The fire swept over all the field and burned up the fences; it burned the cow which had worn the bell, destroyed the barn and the hay which had housed and fed the cow, and even the little house in which the boy, his father, mother, and sister had lived. Then it swept on and destroyed acres of beautiful timber. That it did not actually consume the boy himself and his family was due to the fact that they were fortunately able to get into a nearby lake and stay there, almost submerged, until the roaring flames had passed over their heads.



WATCHING FOR FOREST FIRES

The lookout, perched on a high point of the mountain, is able to see miles in all directions. As soon as the smoke of a forest fire is seen, its location is telephoned to the fire fighters in the valley below, and they are soon at work.

how much crops are grown, how much goods are manufactured, or how many people there are to the square mile, Hamilton County appears in a very light shade or even white. Even though it does not take a high rank in crops, in goods, and in number of people, it serves a good purpose as a playground and source of health for all of New York State, and for much more of the surrounding country.

So much for the geography of Hamilton County; now let us return to the small boy who went out to find the cowbell in the corner of the field.

This cowbell was worth 20 cents. When the boy went out to find it he went through the kitchen on his way to the back door, because that was the shortest to the meadow. As he went out he took some matches in order that he might burn away the brush and last year's trash and leaves so that he could the easier see the bell. The fire would not hurt the bell at all and would readily disclose its hiding place.

ALL forest fires are not so damaging; some are much more so. There are many examples of fires in the Lake States, the Rocky Mountain States, and on the Pacific coast, which have meant great harm and the loss of many lives.

But every little fire which goes through the woods does more damage than can be counted. It may be one that will set back the starting of a new forest for several years.



FIGHTING A FOREST FIRE

These men are not trying to quench the flames, but are clearing away inflammable material which lies in the path of this forest fire so that it will quickly burn out for lack of fuel.

Many of the cone-bearing trees, for example, bear good crops of seed only at long intervals, of from five or seven years. Possibly one of these seed years comes when conditions are favorable for the growth of the little seedlings and they spring up all through the woods. Then a spring fire goes through and seems to do no more harm than to burn off the leaf litter of the preceding fall; yet it will kill all of the tender pine trees which have just started. There will be no other seed year for a number of years, and then, when it does come, it is not unlikely that unfavorable weather conditions such as drought will

keep this new crop of seeds from getting started. The trees of the fire year by this time would have been some half dozen years old, and able to survive this lack of moisture; but the new crop, after getting a start, will dry out and die. Then there will ensue another period without seed and no new trees to form the new forest for another half dozen years.

**I**N the East it is generally considered that the spring is the most dangerous fire season—the time when there is most likely to be damaging fires in the woods. In the West, especially on the Pacific coast, the danger season is in the fall after the long, dry summer. In any case, fall and spring are the times when boys and girls are most likely to go to the woods. Spring calls them to the gathering of wild flowers and to watching the new growths. In the fall, the gathering of nuts and taking farewell of the woods until they shall be in leaf again takes young folks out into the open. These two are the periods when the weather is most delightful and the heat of the sun is not oppressive. Boy Scouts and Campfire Girls, in particular, are likely to "take to the woods" at these times.

Because of their pledges to do a good turn every day and to think of others, because of their interest in woodcraft, and because of their joy in outdoors, the Boy Scout, and the Campfire Girl, and members of kindred organizations have a special duty to see that forest fires are not started by them, and to take pains to put out or get aid in putting out any fire which comes to their attention.

**U**NCLE SAM through the Forest Service, and the various States through their own organizations, have built up well-planned, well-trained fire-fighting forces, yet it is literally true that these have less effect on the question of forest fires than do the common people, and, in some measure, the boys and girls in our wooded regions. For example, if all the boys and girls in the country were impressed with the idea that no forest fire should be started or if started that it should be immediately put out, there would be no forest fires left for those organizations to cope with except those which might be started in out-of-the-way places by lightning. It is true, of course, that some boys are careless with fire in the woods, and that they go away from camp and leave their fire-places burning, or that they will start to make a fire without clearing from around it light stalks, leaves, and trash which would help carry the flames into the surrounding brush and trees. It is carelessness of this sort that has led to the statement that a boy and a match in the woods is a greater source of danger than a boy with a stick of dynamite in a city alley. In the latter case, the boy may demolish himself and a woodshed or two, but in the former he may lay waste a whole province.

**B**ECAUSE it is the blessed spring time and because you are going to the woods it is particularly necessary that you keep in mind this question of forest fire, and that you realize that only harm is done by them, and that good never can result. Even if the fire did no damage whatever to growing things it would destroy decaying vegetable matter which helps to make a fertile soil and also which is able to hold many times its weight of water as a part of the spongy mass, which on the forest



THE PATH OF A FOREST FIRE

From the burned logs in the foreground to the timber line on the distant snow-capped Mt. Shasta, California, a forest fire swept, leaving desolation and ruin in its path which covered several thousand acres.

floor has a large part in regulating stream flow and in preventing floods on the one hand and low water on the other.

**W**HEN you build a fire in the woods, hem it in with stones so that it cannot spread; or if there are no stones available, scrape away the duff so that your fire will be on an earth foundation and will not be able to spread past the defensive trenches which you put around it. And before you go into the woods at all memorize this little verse written by State Conservation Commissioner George D. Pratt, of New York, who does not want any more hunting of cowbells with matches in his State.

"Only a man in a forest green,  
Only a match that was dropped unseen,  
Only a flame—some leaves and wood,  
And only a waste where the forest stood."

## THE FOREST FIRE

By CHARLES H. WINKE

On, on, dread Flood of Devastation; sweep  
All living things before thee; wrap in flame  
The crackling, crashing forest; lay hot claim  
On cot and clearing; through the grasses creep  
Like angered reptile, hissing; wind-lashed, leap  
From blazing hill to flame-swept waters; frame  
The very heavens in red, for naught may tame  
Thy fury till, too long unmoved, they weep.

Though naught but desolation mark thy train,  
Rage on, red King of Ruin!—not for long  
Shall thy dire victory remain complete;  
With dauntless courage man shall claim again  
The ashen waste, and fruitfulness shall throng  
Up from the soil in gardens green and sweet.

# Ornamental and Shade Trees

*A Department for the Advice and Instruction of Members of the American Forestry Association*

EDITED BY J. J. LEVISON, B. A., M. F.

## THE TREE FAKER

HERMANN W. MERKEL

*President American Academy of Arborists*

**T**HREE are various kinds of tree fakers. All who have lived in the country will probably remember the appearance at your door of a venerable gentleman, more or less seedy in appearance, who had with him, carefully tucked from sight, a book of chromos, representing the latest atrocities of the color press, alleged to be faithful reproductions of all that was best in fruit and flower, tree and vine. This volume would usually not make its appearance until after the bearer had assured himself that he was talking to the "lady or gentleman of the house," but after that it would be a most dif-

cult task to get rid of him and his book for a long time, and usually he would take with him an order for a golden elder, a purple-leaved plum, a Carolina poplar, and a Ben Davis apple tree, from all of which deliver us. However, I have no quarrel with this gentleman, for he filled the proverbial long-felt want, and he was really the first propagandist who worked towards the beautification of the surroundings of many dwellings.

The real tree faker is harder to describe. His tribe is large and varied. Sometimes he owns a ladder and a saw as his whole stock in trade. Sometimes he has arrived at the dignity of owning a spray pump, and others have real offices, and get out beautiful literature which is sent broadcast into the hands of an unsuspecting public. Then again he may only own a pot of some mixture, the ingredients of which are a deep mystery to everyone except the mixer, and he won't let the secret out because by means of this mixture, this particular faker is able to cure everything that ever ailed a tree from blind staggers to pip.

I met the work of one of his species one day while in company with Mr. Solotaroff, then of East Orange, when we noticed that a number of beautiful elms on a private place in East Orange, had assumed a reddish bark, and upon inquiry it was discovered that a suave individual had called at this place the day before, and persuaded the owner to let him treat the elms in question by means of a compound which he, the tree faker, had discovered and would paint upon the bark for a consideration. He had stated that he was willing to guarantee that no pest of any kind would ever attack the elms after they had been treated by him, and as a guarantee of good faith, he would collect only one-half the cost of treatment per tree, and come back for the other half the following year. It is hardly necessary to say that he has not yet returned to collect the remainder of his fee.

Another individual, and I think he was the first of his kind that I ever saw, once came to me with a proposition that he would kill any tree that I wanted to get rid of for the sum of one-half dollar. Being pressed as to what means he would employ, he stated that he would bore a hole right into the heart of the tree "where it lived," and then pour in a spoonful of another mystery, which would kill it, and that I could then sell the owner a new tree on which I could make much more than the fifty cents that I would have to pay him.



ALLEGED EXPERTS PRUNED THIS TREE

Tree badly pruned by men who posed as experts. Such trees are common sights in every locality and are a daily example of the need of ascertaining if tree surgeons and tree repairers are competent men.

Of sprayers there are countless numbers, many of them good, honest workers, but unfortunately some that are unscrupulous and will do anything to get money without giving adequate returns. In one case that comes to my mind, I was on an estate with some of the State inspectors, a spraying contractor was working there and came to the owner, with whom we were engaged in conversation at the time, stating that he had sprayed all the maples and elms, and wanted to know whether he should spray the rest of the trees on the place. This privilege, however, was denied him by the owner who had, in the meantime, gotten some information from us. This occurred late in August. There were no pests worth mentioning on any of the trees, at least none that could be controlled by spraying at that season of the year. The owner had found out from us that he was wasting his money, and I believe that the spraying contractor knew it, too, because when I met him later on at the railway station he accused me of trying to take his business away from him. "Butting in," he called it, and when I pointed out to him the error of his ways, he excused himself with the words, "Aw, that fellow has got so much money he won't miss a little of it!" In addition to which he intimated that he would make it worth my while not to interfere with him on other places.

Then there is the individual who makes a specialty of filling up hollow trees, rarely using precautions to prevent further decay, and nearly always willing to operate on trees so old and decrepit that their death is only a question of a short time. The worst case of this I ever saw was on the estate of a prominent New York architect, near White Plains. Here a great many hollow trees, mostly apple trees, had been filled up with loose stones, and the openings covered over with a sheet of paraffin. Needless to say there had been no cleaning or disinfecting, and later on when proper work was finally undertaken on some of the best of these trees, the owner was put to the expense of removing the loose stone filling. Yet this man had been able to collect ten or fifteen dollars a day for his services.

These are all cases in which the operators were ignorant men, but I am sorry to say that there are among the tree fakers many men who know better, and some of the largest advertisers are among the. These will undertake work on old and worthless trees that cannot live, charging outrageous prices for useless work. When the chestnut tree blight was at its worst, I received a letter from a man high in the world of art and letters. You all know him. In this letter he stated that he could cure chestnut blight by the simple means of introducing iron into the sap of the tree, and to prove his theory stated that oaks contained iron which chestnuts lacked, and that oaks were therefore immune.

Another one, a physician, got out pamphlets advertising a "tree serum," though that is not exactly what he called it. This substance to quote from his circular "was introduced into the sap of the tree, and experiments have shown that it is a cure for elm blight, hickory borers, as well as fruit tree blight, and San José scale." This

man got himself into the daily papers, who lauded to the skies both him and his "discovery." In due course of time he came to me, and, as the tree faker has ever been an interesting personality to me, I allowed him the chance



A FINE TREE MISTREATED

This magnificent sycamore tree had a neglected wound which was made worse by a covering of tin. Note the tin partially removed and the whole interior badly decayed. Many trees on the same estate were treated in a similar manner.

of proving his contentions on a tree of his own selection. He picked a large elm, applied some cans, bored holes into the tree which he connected with the cans by means of a rubber tube, filled the cans with his "dope" and departed. I have not seen him since, but the poor elm still shows four great scars around and below the places where his wonderful serum had gotten in its deadly work.

Quite recently a company has been advertising a wonderful discovery which is applied to the roots. Their pamphlet gives very minute directions, which remind one of the hokus pokus of the ancient alchemists, but it very carefully refrains from mentioning any specific pest or ailment that can be cured, though it shows a number of testimonials.

A faker that I well remember came to me with the information that the chestnut tree bark disease, then at its worst, was all a mistake. In fact there was no such thing. The chestnut trees were being killed by ants, and not by a blight. He had invented a compound that would coax all of these ants out of the ground and trees into the jar containing his "dope," and then they would promptly lose all interest in life. This man was sent to

me by a gentleman of wealth and standing, who had been asked to invest some money in the scheme, and when I stated to my visitor that I would discourage such investment, he became greatly exasperated at first, so that I thought him an honest though misguided person. But I was undeceived before long, for as soon as the inventor had cooled down he offered to go halves with me in whatever he could get.

In closing I cannot, therefore, but warn the tree owner to look into the record of any tree pruner, tree doctor or whatever he may call himself, more carefully than he would into that of a lawyer or physician or veterinarian.



THIS MIGHT HAVE BEEN SAVED

This tree had its cavity filled with cement and stone without regard to the decayed condition of the interior. Soon after treatment the tree broke apart as shown in the photograph.

arian, before he employs him, for these are examined by the State and governed by laws, and the tree faker is not. Above all, remember that in the profession of abo-riculture like that of medicine or law there is nothing of a mysterious character that professional men would not care to give to the world or write about for everyone's use. The forestry departments of many of our greatest universities have gone into the subject of ornamental and shade tree care quite thoroughly, and are always ready to give you their best advice, or, where necessary, recommend the men that will examine your trees or do the work. Ask the city forester or the tree warden, or a professional arborist to give you his advice, and let him employ or recommend a contractor to do the work.

Surely your tree is worth at least as much trouble as your dog or your cow, and if your animals are ill or injured, you would not engage the services of a faker, if good men are available, just because the former sent a solicitor to see you, or because his ad confronted you in every magazine. Shun like poison the man with the mysterious mixture or the *only* methods.

#### QUESTIONS AND ANSWERS

Q. Will trees grow in our shopping districts?

L. S., Morristown, N. J.

A. There is no reason why trees should not grow in your shopping district any less than in the shopping districts of Washington, Paris and other cities. It is all a matter of selecting the right kind of tree, planting it properly, and, later on, watering and keeping the crown compact.

Q. Will the asphalt pavement interfere with the growth of our street trees? Will it be serious enough to kill them?

L. S., Morristown, N. J.

A. Asphalt pavement, while to a certain extent interfering with the luxuriant growth of trees, will not be sufficient cause to prevent growth altogether. The streets in most of the large cities are asphalted and still there are trees growing on them.

Q. As a new subscriber, I was examining yesterday the January issue just received. I found a statement that it was possible to kill weeds in a lake by scattering portland cement. The question is of vital importance to me, as I am in general charge of a real estate development upon the brackish waters of the Severn River. We have a beautiful bathing beach whose only drawback is a growth of water-weed. I have tried cutting it out with only limited success. I have been told that a deposit of clean sand four or five inches in depth will be effective, and I have visited places where the beach was absolutely clear for several years after this treatment has been applied. The treatment which you suggest, however, is so much simpler and so much less expensive that I am anxious to know more about it. Is it applicable for brackish water-weed? Is it in any way injurious to fish? How thickly must it be applied?

W. H. M., Baltimore, Md.

A. Relative to your water-weed question, while we have had no personal experience with the method, I can quote from a letter received in 1909 from Mr. J. C. Clyde Power, of Los Angeles, who claims to have used it with success. His letter and the series of questions put to him appeared in a bulletin of the American Association of Park Superintendents, and I will send it to you. Our personal experience has extended to destroying weeds by passing through the water a mass of copper sulphate put into a bag and suspended from a string which was held from the back of a boat that passed around the lake, but this method will kill the fish also. Sometimes it is successful to cut out the weeds with scythes. The printed matter may give you other ideas.

Q. In the forest under my care there are a number of historic trees, some of them battle-scarred, which I wish to preserve. Some of these trees are quite old and beginning to show serious signs of deterioration. These, I wish to care for by cleaning, properly treating and filling all cavities. As a member of your association, I take the liberty of asking for such information as may be at your command regarding work of this kind. What I particularly desire to know is the proper chemical to use in painting the wood before filling is made. Some of these veterans have died, and I wish to preserve their trunks standing, as high as 8 or 10 feet. Can you tell me what chemical should be applied to the exterior of these stumps to best preserve them?

D. L. R., Pittsburg Landing, Tenn.

A. Trees with decayed cavities should have the latter cleaned out thoroughly and freed from decayed wood; the interior of the cavity should be painted with creosote and then a coating of coal tar. After that, if the cavity happens to be very deep and likely to hold moisture, it may be filled with cement and bricks as set forth in the article sent under separate cover, which will give you a complete description of this sort of work, its remedies and possibilities.

As to the stumps which you want preserved, I would suggest painting those with creosote. This material is the best preservative as well as the least obtrusive looking. Of course, in any of these cases, if the trunks or cavities are so badly covered with fungi that the latter can not be eliminated, it is not worth keeping them because the fungi are bound to turn the wood into dust in course of time.

#### ADVICE FOR MAY

April and May is the time for planting and because of the short season to do this work all other forms of attention are generally subordinated to the planting work. The following brief notes on planting may, therefore, prove timely.

#### CARE OF TREES AND SHRUBS ON ARRIVAL

Before the plants arrive, dig a trench from two to four feet wide, one foot deep and long enough to hold them all.

As soon as the trees or shrubs arrive, untie the bundles, keeping each kind separately, and place the plants in the trench temporarily until they can be set out in their proper places. Very carefully cover the roots with earth and give a copious watering. In unpacking the plants, in placing them in the trench, or at any other time, be careful *not to expose their roots, even for a moment, to sun or wind, and at all times keep the roots moist.*

Check up the number and kinds of plants received and O. K. the lists submitted with the stock.

#### HOW TO PLANT

1. Determine the location of the plants and prepare the holes.
2. Plant when the frost is out of the ground.

3. Keep the roots well protected from the minute the tree leaves the wagon to the minute it is planted. Do not take off more plants from the wagon than is absolutely necessary.

4. Cut all broken roots and cover wounds with coal tar.

5. Cut back the branches, but do not remove them entirely unless they interfere or are too thick. With some trees like the sycamore or oak or poplar, you can cut back more than with others. Do not cut the leader, and do not cut evergreens.

6. Let only good soil come in close contact with the roots, and have the good soil well packed around the roots; work it in with the fingers and stamp on it. Place the poor soil only on top.

7. See that the tree is planted upright and firm.

8. Plant the tree no deeper than it stood in the nursery.

9. Water the plant only after all soil has been put around its roots and the hole filled.

10. Leave the place clean and do not leave tools behind.

#### WHAT TO DO AFTER PLANTING

1. *Cultivate and Water.*—It should be borne in mind that when a tree is transplanted, no matter how carefully the work is done it is impossible to take up the entire root system, and therefore, before it is able to care for itself, new roots must be formed to take hold of the soil. In the meantime the moisture is being continually evaporated from the trunk and branches by the action of the wind and sun, and this must be balanced by an artificial supply. During the dry spells and hot weather of the following season, the soil around the base of the tree, for a space wider than the hole, should be stirred up and watered. *Watering during the first summer is very essential and more important than watering during subsequent summers.* The water should not be sufficient to make the ground soggy. Two pails of water applied to each tree on a city street twice a week is enough. On lawns and for smaller trees, the quantity of water will be much less, and in woodland a little water three or four times during the summer is sufficient.

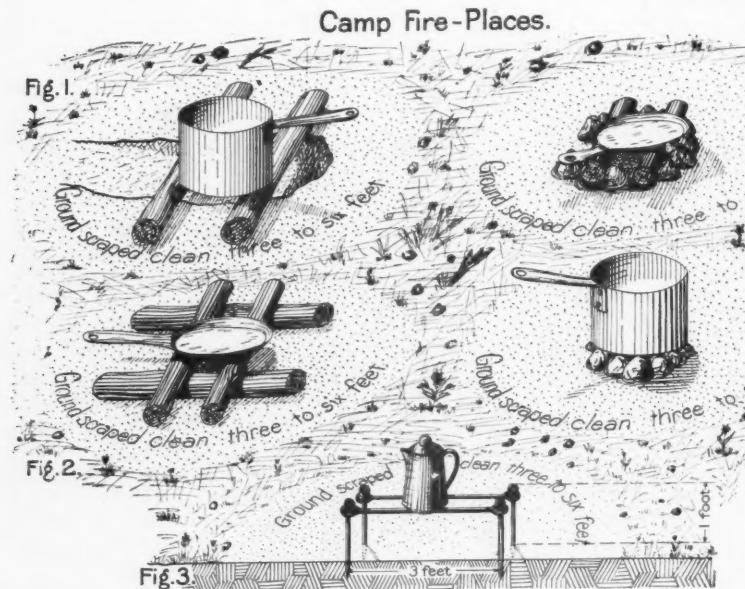
2. *Fertilize.*—In the fall, a layer of old manure or leaf mold, 3 to 4 inches thick, should be spread over the surface around the tree to a distance of a foot or two beyond the lines of the newly filled hole. This treatment will enrich the soil, shade the ground and help to hold the moisture.

#### NEW STYLE OF FARM GATE

A WISCONSIN lumberman has begun to do his share in the extension of the lumber industry by marketing a wooden farm gate, of a special design, solid lumber, and solid hanging, which is painted yellow with the name of the owner or occupant of the farm in black, with his rural route number. The experiment resulted in the sale of three hundred gates in a single Wisconsin county in one month, and in cleaning up the lumberman's yard of short and almost unmarketable material.

# How to Build a Camp Fire

WITH the camping season due there come the usual questions on how to build camp fires. There are several varieties, most of them simple and effective and easily constructed even by a novice in camping. There must be considered not only the kind



of camp fire which gives the best service but the kind which is least dangerous. The man who is careless with his camp fire should not be allowed in the woods for all too frequently he is responsible for forest fires which do tremendous damage. The Forest Service has issued a hand book for campers in which the following excellent instruction regarding camp fires is given.

Camp stoves should be taken whenever they can be transported. They are safer than open fires, more convenient, require less fuel, and do not blacken the cooking utensils. Collapsible sheet-iron stoves may be obtained.

In the absence of a stove an open fire must be built. A safe and serviceable fireplace can be made of rocks placed in a small circle so as to support the utensils. (Figs. 4 and 5.) Where rocks are not obtainable, poles may be used as in Fig. 2.

For permanent camps it pays to build a stone fireplace. One is shown in the illustration. A piece of sheet iron will prevent the blackening of the pans and makes a better draft.

For temporary camps the fire should be built as follows:

Dig a hole about a foot deep and about 3 or 4 feet in diameter. Shovel away the side toward the wind. Lay green poles across the hole to support the pots and pans, and build the fire underneath. (Fig. 1.)

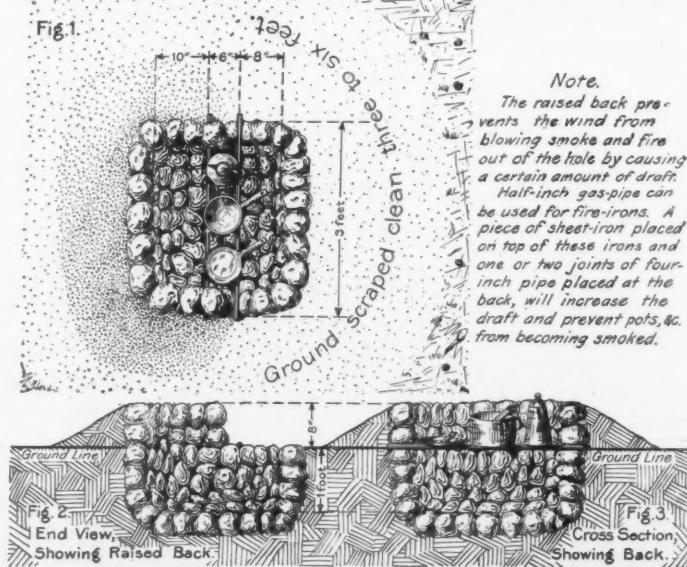
Fire irons are often a great convenience. A piece of three-eighths-inch round iron 4 feet long is bent at right angles a foot from each end and the ends are sharpened. Two of these irons are placed side by side, the ends are driven into the ground and the fire kindled beneath them. Instead of being made in one piece, the pegs and cross-bars may be connected by rings in the ends. (Fig. 3.) They will then fold and be easier to pack.

Camp fires should never be larger than necessary, and the utmost care should be taken to prevent sparks from being carried into the neighboring forest. Clear away the litter for a considerable space about the fire. And be sure to *put the fire out* before you leave it.

A shovel is nearly as important a tool as an ax in camping. Do not count on finding one along the way, but put one in your outfit.

During wet weather look for kindling in burned sugar pine or yellow-pine butts or in pine knots. The under

## Details of Camp Fire-Place Construction.



side of a leaning tree will usually contain dry material. Dead branches—of manzanita, etc.—that have not yet fallen are drier than those on the ground. Bark from fir snags is excellent fuel.

Where matches are scarce or when the weather is stormy, first light a candle and kindle your fire from that.

Hints on fire protection are always timely and fit particularly well with these instructions about camp fires.

The first thing is prevention. Bear in mind the Six Rules. Be particularly careful with camp fire, matches, and tobacco, since carelessness with these is punishable by law.

Scrape all inflammable material from around the fire before lighting it. Make a fireplace either by digging a hole or by piling up rocks. The fire will then not only be safer but will draw better.

Before leaving camp see that the last spark is extinguished. Pour water on the embers and then cover them with earth.

Don't make your fire too large. Large fires are not as convenient to cook by as small ones and are more trouble to put out.

If you discover a fire, go to it at once and put it out if you can. A small fire can be put out easily by throwing handfuls of earth, sand, or dust at the base of the flame. The flames may also be beaten down with sacks or with branches, but care must be taken not to scatter the fire.

If the fire is spreading too rapidly to be attacked directly, cut and scrape a trail some distance ahead of it. Do not back-fire; this is work for an experienced man. If a fire is serious enough to require this treatment, the work should be left to a ranger.

The best tools for fire fighting are the shovel, ax, and hoe or rake. In open pine forest very little ax work will be required. Shovel or rake a trail through the needles down to mineral soil, and guard the trail.

To stop a fire burning in brush the trail must fire be cut with the ax and then scraped. The brush should be thrown to the side away from the fire. The litter may be scraped toward the fire.

Pick a route for the fire trail that will avoid brush patches if possible. The crest of a ridge is an excellent location, since the fire naturally checks at the top.

Do not give up because the fire is gaining headway or because you lack tools. The fire has already been reported by lookouts, and rangers are hurrying to it properly equipped. Stay and help them; and in the meantime do what you can to keep it in check.

*See that a fire is cold before you leave it.*

Report all fires to the nearest forest officer.

Do not suppose that because a fire is merely burning in apparently worthless brush it is therefore doing no damage. Such fires are often the most serious.

#### CHESTNUT BLIGHT DAMAGE

THE chestnut blight has already done damage estimated as close to \$50,000,000. The disease attacks both American and European species, but does little damage to those from Japan and China. Plant

breeders, by crossing Japanese chestnut and native chinquapin, have produced resistant trees. Some of the Chinese chestnuts are said to grow 100 feet high in their home forests.

#### THE TWIN BEECH TREES

ON the Jacob Purlee farm, four miles south of Salem, in Washington County, Indiana, a natural curiosity which is always attracting a large number of sightseers is twin beech trees. The



#### A NATURAL CURIOSITY

Twin beeches on the farm of Jacob Purlee in Washington County, Ind. The limb forming the perfect union is 20 feet above the ground.

limb that binds the two trees together is 20 feet from the ground and forms a perfect union between the two trees.

#### HOUSES FOR RURAL TEACHERS

A MOST interesting scheme for social service, one affecting every hamlet in the land, has been instituted by the National Lumber Manufacturers' Association, in the proposal to build a home for every rural school teacher in America. Louisiana will be one of the first states where the plan will be carried into effect, and a thorough investigation of the conditions in that state preceded the announcement of the social service plans of the lumber manufacturers. The association has not as yet formulated its plans for pushing this new department of public service by actually assisting the schools of the nation to build homes for teachers, but work on this philanthropic enterprise is already under way and the association plans to have its plans ready for announcement in a few weeks.

# Wood Preserving Department

By E. A. STERLING

*Ex-President American Wood Preservers' Association*

THE city of Minneapolis, which already has a larger percentage of creosoted wood block streets than almost any other city in the country, has recently given further evidence of its conviction that this form of pavement is best by contracting for an additional 350,000 square yards. The blocks are to be of yellow pine, 3½-inch deep, creosoted with 16 pounds of oil per cubic foot. It is reported that the contract price for the blocks is \$1.46 per yard. This is an increase of 14 cents per yard over the 1915 prices in the same city and represents higher prices for lumber and creosote. The value of the total order will exceed half a million dollars, the blocks will require 1,000 cars for transportation, and will be equivalent to over 12 million feet board measure of lumber. This amount of block will pave 22 miles of 27-foot roadway. It is stated that Minneapolis has expended over a million and a quarter dollars for creosoted wood block pavements in the last thirteen years, and the total cost for maintenance has been less than a thousand dollars, which is practically negligible.

Increasing attention is being given to the preservative treatment of farm timbers, and the lumber used around homes, both suburban and rural. While fence posts have been treated to quite an extent for many years, the application of practice has not been very widely applied to lumber and small timbers. This is partly for the reason that suitable creosote or other preservatives have not been available in retail quantities, and in part because the possibilities have never been properly promoted. The sills and basement flooring of many farm buildings, entire structures in the case of swine houses, poultry houses, board walks, gates and many other essential farm structures can be treated at reasonable cost so as to give greatly increased life from decay. A gradually increasing amount of literature is being made available, among which may be mentioned Bulletin 158 on Preservative Treatment of Fence Posts, issued in August, 1915, by the Agricultural Experiment Station, at Ames, Iowa. Previously a bulletin on the same subject was printed by the Maryland Agricultural Experiment Station, and the National Lumber Manufacturers' Association now has a bulletin on the Preservative Treatment of Farm Timbers on the press. It is also understood that the Forest Service has compiled additional information of a very complete character, which will be published in the near future.

That the American Wood Preservers' Association is vigorously carrying out its policy of developing standard treating practice, and giving educational publicity to the wood-preserving industry, under the new administration, is indicated by the energetic work of the Executive Committee in outlining projects for the present year. New appointments have been made on the various standing committees, and the personnel insures the greatest

possible activity and the best results. Special attention is to be given this year to educational publicity, both of the methods and results of proper preservative treatment, and of the aims and benefits of the association. At a dinner of the Executive Committee, standing committee members, and others in Chicago, in March, President Carl G. Crawford outlined the policies which he expects to carry out, and called on the various men present for an expression of their views.

Creosoted wood blocks, already extensively used as paving material for city streets, have been coming into use as flooring for the last four or five years, according to the Forest Service. Its durability, noiselessness under heavy traffic, and sanitary properties are its chief advantages for paving and also give it special value for making floors, especially for use where heavy trucking, the moving of heavy machinery, or other severe use makes the maintenance of floors a serious problem. Its rather high cost is its chief disadvantage. Wood block is now widely used for flooring in factories, warehouses, machine shops, foundries, various types of platforms, wharves, and docks, and for such miscellaneous purposes as hotel kitchens, hospitals, laundries, and slaughter houses. Possibly one of the oddest of these uses is for the floors of wild animal cages and runways. Notwithstanding the recent increase in the use of wood block for these purposes, it is believed that the growth of this industry will be even more rapid in the future. These floors are well liked by the workmen because they are easy on the feet.

Most of the blocks for these floors are now made of southern yellow pine. Hemlock, larch, Douglas fir, black gum, beech and maple are also used. The blocks are sawed from long sticks of timber and are treated in huge steel cylinders from 6 to 7 feet in diameter and 100 feet or more in length. Creosote oil is run into the cylinders and pressure is then applied to force it into the wood. The oil is a product obtained in the manufacture of coke from coal and its purpose is to prevent decay of the wood, and also to prevent shrinking and swelling of the floor after it is laid.

According to statistics just compiled jointly by the American Wood Preservers' Association and the Forest Service at Washington, D. C., there was treated at 102 plants in the year 1915 a total of 141,858,963 cubic feet of timber, which compares with 159,582,639 cubic feet by ninety-four plants in 1914; a decrease in quantity of about 11 per cent in 1915. Of the 1915 output, cross ties contributed 78.4 per cent of the total, construction timbers, 8.3 per cent, paving blocks, 5.4 per cent, piling 4.4 per cent, poles 1.7 per cent, and the balance consisted of cross arms, lumber, etc.

With the exception of two years, 1913 and 1914, the volume of timber treated in 1915 was the largest on record.

# Lumber Uses

BY WARREN B. BULLOCK

**A**CENTRAL exhibit of the commercial woods of America, with diagrams and models to show the manner in which the various woods may be used, is planned in Chicago by the lumber associations of America. There will be similar building exhibits in other cities, for which the plans are nearly completed in Detroit and San Francisco.

The general display in Chicago will be chiefly of a permanent nature, and will be installed as part of the Building Material Exhibit in the Insurance Exchange. The exhibit is being so planned that any builder can at once get an idea of the character and uses of every commercial wood in America. It is planned to make a collection of woods, in different finishes, to a total of literally thousands. All sorts of finishes will be shown, and various types of construction.

There will be cases containing hundreds of panels of wood, in the natural finish, and in stains. There will also be for the building engineers an exhibit of treated and untreated woods, good and bad structural material, giving visual examples of what kinds of wood to select for various building purposes. One of the striking displays will be a large model of a heavy timber mill constructed building, showing floors, roof timbers, posts, girders, and all the interior work on a factory building of large size.

There will be several models of farm buildings, and also of four frame houses to cost from \$2,000 to \$8,000, preferably for homes in the city, for that is where most of the spectators at the exhibit will come from. Sidewalks, creosoted block roads, models of garages, and chicken houses, will also be provided. One exhibit will be of large-sized specimens of structural material and other such phases of the industry will be shown.

It is the biggest part of this plan, however, to copy this exhibit on a less extensive scale in every large city in the country, to provide information for prospective builders. There will be the permanent exhibits, and then there will be also special exhibits, which will be sent from city to city to be shown for a week or possibly a month at a time, bringing special building points to the attention of possible builders.

Speaking of farm buildings, such as will be shown in model or diagram in this building exhibit, the National Lumber Manufacturers' Association has just completed the first two of a series of nine bulletins on farm buildings of various types, which goes into detail on the construction of practical buildings about the farm. The first two bulletins are on implement sheds, and grain-storage buildings, two of the most important, but most neglected buildings about a farm.

K. J. T. Ekblaw, of the University of Illinois, author of these bulletins, estimates that a fair average life for

farm machinery allowed to stand in the open is five years. He says that farmers who care properly for their machinery can get from twenty to twenty-five years' use of the same type of machinery. He figures, therefore, that on an average investment of \$1,000 per farm for machinery, the building of an implement shed for \$250 will save the farmer \$1,800, or rather, give him an investment representing \$1,800, gauged by its savings. He says that the growing use of the small tractor on the farm increases the necessity for a well-built implement shed. The bulletin gives storage space dimensions for the various items of farm machinery, with suggestions on the technical side of the building problem.

In the same author's bulletin on grain-storage buildings, he brings out that while economy in construction is a main factor in the building of implement sheds, strength is of the utmost importance in the building of granaries. The problems of pressure on walls, the foundation strength, floors and framing, are all given due consideration. The use of solid materials, the right sizes and grades of lumber, it is asseverated, will avoid the complaints against the old style buildings made of wood not of the best, and not erected on the basis of strength of every timber in the construction.

Though the building exhibit is only planned, it has already been selected as the meeting place of the newly organized Home-Makers' Guild, of Chicago, founded by Mrs. T. Vernette Morse, widow of a former well-known middle western lumberman, an organization which is affiliated with the National Vocational Art and Industrial Federation.

The University of Washington has just held a unique exhibition, in the demonstration for the general public and the men in the industry as well, of woodcraft, mining and road and trail building. A sawmill fed by a sky-line logging apparatus was in actual operation, and the problems of forest-fire fighting were exemplified. The day of April 13 was open house at the university, and several of the colleges in the university vied for the honor of giving the best showing. The forestry building was shown to visitors with a typical camp fire, sawmill, with apparatus for swinging logs across the country in the air. The operations were carried on as they are in the real woods, and the lumber showing was concluded with a demonstration of how the forest products can be utilized in building, showing finishes and construction work.

Last month, the writer told of the manner in which birch was coming to be used for the manufacture of gunstocks, taking the place of the traditional black walnut. Since that number of *AMERICAN FORESTRY* was issued, there has come to hand an article showing how birch is being used for fuse plugs for the shells sent to

Europe for use against the trenches of the German armies. Fuse plugs are used to protect the threads of the fuse socket, and to close the powder compartment of a loaded shell, when in transit, and when on the battle-field the shell is about to be used, the plug is removed and the threaded fuse substituted. Bronze, steel or other metals were formerly used for these plugs, but the Canadian manufacturers especially have been coming to use birch instead. White and yellow birch, beech and maple are all used, with white birch in the lead, because these woods do not change in size with the changes in climatic conditions.

At present, owing to the suddenly developed demand, these fuse plugs are not being made on automatic lathes, but this type of lathe is being developed to enable larger quantities to be turned out. Including the felling of the tree there are seven steps in the making of these plugs. As against the mining, smelting, refining, molding and casting of the metal plugs before the work of manufacture is fairly under way, the wooden plug offers amazing economical gain, even with a smaller cost. The finished plugs are shipped to the ammunition factories in bags containing 1,000 plugs each.

---

The branding of lumber is spreading throughout the nation at a rapid rate. This is the greatest modern development of the industry, and is advancing so rapidly that the lumber associations can hardly keep up with the demand for "certified timber."

**"Make Every Timber a Promissory Note."**

This is the phrase which is carrying the trade-marking idea into every part of the land. It is the talking exemplification of the new spirit among lumbermen to standardize lumber, make it a recognized quality product, so that architects will not be afraid that their specifications will not be carried out. The spread of the "certified lumber," was shown at a recent conference in Chicago, when it was found by a poll of the secretaries of various lumber organizations, that every association in the country was either considering branding its output, or was already doing this branding.

---

The United States will have a lumber exhibit at the Paris Reconstruction Exposition, which opens May 1, and in which the French, with a preparedness attitude which might well be duplicated by American lumbermen, in their fight for the retention of their proper place in the building industry, are beginning to plan for the rebuilding of the sections devastated by the war. The exhibit in Paris will be made by the Southern Pine Association, and will be in charge of that association's foreign representative, but while essentially a southern pine exhibit, will be so displayed as to portray generally the possibilities of American lumber. In its arrangement it will be a general American exhibit, not merely of the southern states. Three typical farm buildings, and a small mill-constructed building will be among the most striking features in the exhibit.

**PURPOSE OF ARBOR DAY**

"**A**RBOR Day is being perverted in too many States into a mere day for the inculcation of the aesthetic side of tree and bird life. Arbor Day has a bigger purpose, a bigger scope. It should be observed from the economic side as well as the aesthetic and artistic." This is the declaration of State Superintendent of Instruction C. P. Cary, of the Wisconsin school system.

"Arbor Day should teach conservation of the forests, both for the future timber supply of the nation," he says, "as the second industry in importance in America, as well as for the protection of the head waters of our rivers. Arbor Day should do more, it should teach the use of lumber in a way that the school children can understand, so they will realize the importance of trees, as well as their beauty.

"I find on looking over the Arbor Day literature of many States that Wisconsin stands practically alone in this recognition of the dual purpose of Arbor day. For several years past we have taken advantage of the day to teach the children of the State the value of trees, the uses of lumber, conservation as well as tree-planting, and the great principles of the conservation of the forest for the future needs of the commonwealth. We do not overlook the artistic side of the day, and I do not believe that many States issue a more artistic Arbor Day publication than that of Wisconsin. But we also teach the children the use of timber, the value of a tree, not alone its beauty for giving shade in the city, but its use in the forests and how every daily habit involves the use of something of wood.

"We have gone deeply into fire prevention, and in the last two years have broadened our work in this line. We have begun to teach the children that the way to conserve the forests is not alone to prevent forest fires and wasteful cutting of timber, but also to prevent the burning of houses by carelessness in the home. Every house that is burned means that many trees must be felled to provide the lumber for a new home.

"When I say that other state school departments should teach the economic side of the tree, I am advocating, therefore, what we are already teaching in Wisconsin."

---

**A CREDITABLE PUBLICATION**

**T**HE *Empire Forester*, an annual publication, by the student body of the New York State College of Forestry at Syracuse, N. Y., has just been published. It contains very interesting articles written by students, graduates and eminent foresters, and is amply supplied with cuts to illustrate the articles. The cover design, together with the general makeup of the magazine, reflects great credit on the representatives of the student body in charge.

## PLAN FOR TREE EXHIBIT

In its work of cooperating with the General Federation of Women's Clubs, this department of AMERICAN FORESTRY has prepared the following outline of a plan for an exhibit in ornamental and shade tree work, to be held in New York City in May, 1916:

## VALUE OF TREES

1. Streets without trees and streets with trees—photos.
2. A home with and without trees.
3. Example of a tree providing shelter to mothers and children.
4. Specimen trees showing beauty of trees in all seasons.

## PLANTING

1. Photograph and transparencies showing specimen trees of best varieties.
2. Showing streets properly planted with suitable trees.
3. A model showing an ideal shade tree and methods of planting.
4. Chart showing detailed cost of planting a shade tree.

## PRUNING

1. Specimens showing proper pruning and results of improper cutting and failure to cover wound with coal tar.
2. Photos showing trees and streets badly pruned and improperly pruned.
3. The best tools used in pruning trees.

## INSECT ERADICATION

1. Cases illustrating, with actual specimens, the life histories of some of the most important insect pests, as the Tussock, Brown tail and Gypsy moths, the Leopard moth, etc.
2. Model spraying apparatus from well-known makers.
3. Chemicals used in spraying.
4. Photos showing spraying work in cities.
5. What the children may do to help insect eradication.

## DISEASE ERADICATION

1. A neglected wound showing fungus growths.
2. A treated wound.
3. Collection of most important fungi.

## CITY FORESTS

1. Photos showing the City Forests of the Country and how they are being developed.
2. Photos showing City Forests abroad.

## MUNICIPAL PARKS

1. Best park views.
2. Utilization of parks by the people—park recreation.

## STATISTICS

1. Chart showing the number and appropriations of shade tree commissions, Park Departments, etc.

## EDUCATIONAL

1. Collection of city tree ordinances.
2. Best books, magazines, pamphlets, etc.
3. Circulars on Children's Tree Clubs, Arbor Day Celebrations, etc.

## THE WOOD FLOUR INDUSTRY

MORE than twenty thousand tons of wood flour, valued at \$300,000, are used annually in the United States in two widely different industries, the manufacture of dynamite and the manufacture of inlaid linoleum. Wood flour is also used in making composition flooring, oatmeal paper, and in several other industries. It forms one of the means by which the huge waste product of our lumber mills is beginning to find some better means of disposal than the burner. Since a total of 36,000,000 cords of such waste is produced each year at sawmills in the United States, of which about one-half goes into the furnaces as fuel, while the rest is burned as refuse to get rid of it, there is no lack of raw material for industries which can develop ways of turning this waste to account.

Two methods of producing wood flour are practiced, one using millstones, the other steel burr rollers to pulverize the wood. The latter requires only one-fourth as much power to operate as the former and was developed on the Pacific Coast to handle sawdust as a raw material. The mills of Norway which produce much of the European wood flour are of the stone type.

Wood flour mills are scattered over the country from Maine to California wherever the proper combination of wood and water power is available, and the domestic wood flour competes with the Norwegian product which, before the European war, was delivered at Atlantic ports for \$12.50 to \$15 per ton.

## LARGE SALES OF NATIONAL FOREST TIMBER

BIDS were recently accepted by the Department of Agriculture for two large bodies of National Forest timber estimated to contain 188,100,000 board feet. One is in California and the other in Utah. With one exception, these are by far the most important sales made this fiscal year, which is expected by forestry officials to run considerably above last year in receipts from timber sales, the first five months having shown an increase of nearly 40 per cent. The California sale is on the Plumas National Forest, in the Sierra Mountains. The most valuable timber is sugar pine, for which \$3.25 per thousand was bid, with an estimated total of nearly 26,000,000 board feet on the tract. For yellow pine, of which the amount is put at over 37,000,000 feet, \$2.60 was bid.

The Utah timber is in the Wasatch National Forest, and will be cut chiefly for railroad ties. It comprises, according to the Government's estimate, 82,100,000 board feet of green and dead lodgepole pine, Engelmann spruce, and Alpine fir. The sale price is 10 cents for each tie cut and one-half cent per linear foot for mine timbers.

# Editorial

## THE FAILURE OF LOUISIANA'S FORESTRY POLICY AND ITS REMEDY

LOUISIANA was the first of the southern States to enact a forest fire law, and has at all times shown more public interest in forestry than any other southern State. For many years the State Forestry Association has held successful annual meetings. Forestry measures have been proposed from time to time and the State has a law levying a tax on the timber cut by lumbermen which brings in many thousand dollars annually. It was the original belief and intention of those who advocated this measure that the sum thus raised, or its equivalent, should be spent in furthering the forestry interests of the State, and in this way derive from the destruction of the forests the means for at least partial restoration of this great natural resource.

That the forest wealth of the State, and the industries dependent upon it, are doomed to disappear under present methods need not be emphasized—it is only too apparent. In spite of the enormous reproductive power of the commercial pines which form such a large percentage of Louisiana's output, nearly all of the second growth timber occurs, *not* on cutover pine lands, but on farm land turned out or abandoned, most of it in the period shortly after the Civil War. Everywhere fires destroy the young pines as rapidly as they spring up, due to the large amount of grass and weeds on such lands, and incessant burning. Under present policies, Louisiana's forests are doomed.

Let it not be urged that forest destruction is a blessing in disguise, opening up lands to agriculture and increasing the population and wealth of the State. The most prosperous States are those with a diversity of industries, and the most desirable economic condition for a community to attain is a true balance between agriculture and forestry, in which each farm has its woodlot, each town and county its public forest areas, with larger tracts in poorer or hillier sections in State or national ownership. The utter neglect of the immense potential value of lands for timber production—a value shown throughout the South by the pay rolls of the lumber companies—would be inexcusable folly.

Yet in spite of the urgency of the case, and the interest so widely shown, what has the State of Louisiana actually done for forestry? Practically nothing. This condition demands an explanation, and we find it, strangely enough, in the very spirit of progressiveness which unfortunately led the State into the adoption of a form of State organization fundamentally defective. In 1910 Louisiana responded to the then new, and widely heralded expansion of the forestry movement to include the conservation of all forms of natural resources, and created a State Conservation Commission, which not only superseded the old Fish and Game Commission, but

undertook to administer the mineral resources, and the forestry laws of the State as well. For revenue, they had the income from fishing and hunting licenses, and from the timber tax. They had *permission* by law to appoint a state forester, but Louisiana is without a state forester today.

Universal experience in state forestry in this country has shown that the amount of progress which a State makes is gauged by the educational efforts it puts forth in forestry, and that trained or educated foresters are the only effective agents for conducting this propaganda. A second powerful reason for employing a technical forester of experience is found in the need for a proper solution of the many problems arising in state forestry—problems of taxation and legislation, problems of fire protection, and of securing natural reproduction. These must be worked out on the ground by men trained to observe, broad-minded and constructive in their mental processes.

Why has not the Conservation Commission of Louisiana provided the State with a forester, when for six years they not only have had it in their power to do so, but have been repeatedly urged to this course by the Forestry Association and others? As late as April 1, 1916, the Commission, through its chairman, made the statement that they had decided that the appointment of a forester was necessary, but unfortunately the funds of the department were at such a low ebb that they were unable to finance it until later in the year. And this is the last of a number of similar verbal assurances extending over several years.

To come back to our first statement, it is not the intentions of the Commission which are the cause of the trouble—the form of the organization itself is wrong. The reason why out of all the funds at the disposal of the Commission, no money can be found for forestry, is that such a commission, wherever found, invariably places fish and game protection, minerals, waterpowers and what not, ahead of forestry in their consideration. This is natural and logical. Fish and game appeal directly to more people, being in an immediate revenue in licenses, and are good politics. Forestry looks to the future, requires idealism and present self-sacrifice. There is nothing in forestry for the politician, nor can he ever hope to deliver the goods. Therefore, he fights shy of it. A mixed commission means the death knell of forestry, unless it is already so strongly entrenched that it is able to survive the blighting tendencies of such supervision or neglect.

There can be no hope of real progress in Louisiana forestry until the State has divorced its forestry work from the present Conservation Commission, and placed it in the hands of a nonpolitical State forestry board.





This board should be adapted to Louisiana conditions, but, following precedents of other efficient and successful State boards, it should probably be composed of about five men, who receive no salary, but only their expenses and a per diem, when engaged in the Commission's work. The personnel of the board *must* be non-political and interested and informed on forestry. To secure such a board, at least three of its members should be men whose occupation especially qualifies them for the position. Louisiana has such men,—for instance, the presidents of state educational institutions, the Professor of Forestry at the Louisiana State Agricultural and Mechanical College, or others. An admirable plan is to authorize the State Forestry Association to nominate one of the members of the board, and to secure the cooperation of the lumber industry by permitting them a similar nomination through the most representative State association. On a fairly large and well constituted board the governor might be included as an *ex officio* member, but he should not be given unlimited power of appointment.

pointing the remaining members. This will remove the temptation of converting the board into a political asset.

This board should appoint the State Forester, who need not be a member of the board but should be the secretary and executive officer. It should be provided by law that the forester must be a technically trained man, educated in his profession and with some experience in actual practice of forestry. This board should be given for forestry purposes an amount equivalent to the income derived from the State tax on timber products.

When this step is taken, further progress is assured. Until it is done, all the energy and enthusiasm which may be brought to bear upon the subject will be dissipated in the sands of political indifference and inefficiency, and another decade will see the State with vastly diminished forest resources, the end of the industry practically in sight, and nothing accomplished to restore the economic balance or replace the forest as one of the leading resources of the proud queen of the South.

### \$3,000,000 APPROPRIATION NEEDED

In a few days, when the House Agricultural Appropriation Bill comes up for consideration in the Senate, there will be presented Senator Gallinger's amendment to it. This amendment provides for an appropriation of \$3,000,000 to continue the purchase of forest lands in New England and the Southern Appalachian states for the protection of the headwaters of navigable streams. \$8,000,000 of the \$11,000,000 appropriated by Congress five years ago under the so-called Weeks Law, for this purpose, have been expended, but the remaining \$3,000,000 reverted to the Treasury because the period for using it lapsed before the necessary legal arrangements for purchasing the land desired could be completed.

There is every reason why this \$3,000,000 should be reappropriated to continue the work for which it was intended. The Forest Reservation Commission, having charge of the purchase of the lands secured under the Weeks Law, has recommended the continuation of the work, so has Secretary of Agriculture Houston, and so do individuals and influential organizations throughout, not only New England and the Southern Appalachian states, but the entire country.

The American Forestry Association and cooperating organizations have been actively advocating this measure for some time, and have recently requested members of the Senate to give their attention to the amendment when it comes up. This amendment will be referred to the

Senate Committee on Agriculture and Forestry, and it is believed will be reported favorably and will likely pass the Senate. If it does it will go before the Senate and the House conferees and it is hoped may then be presented to the House for a vote. The measure however has already been unfavorably reported by the House Agricultural Committee, by a vote of 8 to 7, and the action of this committee will of course have considerable weight with the House.

At the same time the inclination of Congress to economize in every possible direction, the press of much important legislation, and the desire to get as much business as possible completed before the Republican and Democratic conventions are held all tend to prevent this very important forestry measure getting the full consideration to which it is entitled.

Every member of the American Forestry Association is therefore asked to aid in the effort to secure the favorable attention of members of the House to this amendment. They are asked to write personal letters to members of Congress from their districts, pointing out the importance of continuing the purchases of forest lands at the headwaters of the navigable streams in New England and the Southern Appalachians, and urging them to give their personal attention to the Gallinger amendment providing \$3,000,000 for this purpose.

Members of the Association are requested to do this *NOW*. In a few more days it may be too late. Action is requested *AT ONCE*.



## They Like American Forestry

"You certainly are to be congratulated on the new numbers of the AMERICAN FORESTRY magazine. Not only is its appearance and form greatly improved; but the division into classified departments is a distinct and notable improvement in itself. There is no doubt that the magazine, in this new form, will increase not only in its circulation, but in its usefulness as well."

JOHN M. BRISCOE,  
*University of Maine, Orono, Maine.*

"When the announcement was made a few months ago that a change would be made in the size of AMERICAN FORESTRY, I was not favorably impressed, for I thought it meant another magazine in cumbersome form. When I received the August number I was greatly pleased with the improvement in the illustrations and the general makeup of the publication. All the numbers since then are also equally satisfactory. I feel that it is due you that I admit the error of my first impression regarding the change of form of the magazine, and that I give you whatever encouragement you may derive from the expression of my satisfaction in the improvement which has been made in this publication."

J. P. KINNEY,  
*Washington, D. C.*

"I am delighted with AMERICAN FORESTRY in its new form and think both you and the Association should be complimented on the excellence of the get-up and of the matter and arrangement. It is most interesting."

ELLWOOD WILSON,  
*Grand Mere, P. Q., Canada.*

"I am glad to take the opportunity of offering my congratulations upon the splendid magazine you are now turning out, and I hope it is receiving the additional support which it deserves."

ARTHUR SMITH,  
*Reading, Pa.*

"I am certainly delighted with the new magazine."

T. D. HOBART,  
*Pampa, Texas.*

"I like the improved magazine very much indeed. Keep the good work up."

L. D. SWEET,  
*Denver, Colo.*

"I am reading the AMERICAN FORESTRY MAGAZINE with the greatest interest and admire its very beautiful pictures and very good articles."

COUNT LOUIS AMBROZY,  
*Piazza San Marco, 51, Palazzetto,  
Venezia, Rome, Italy.*

"Your magazine is elegant in its way, and constantly improving."

C. B. FILLEBROWN,  
*77 Summer Street,  
Boston, Mass.*

"We wish to commend you for the splendid work you are doing and the improvement made in the magazine."

THE LOUISIANA RED CYPRESS CO.,  
*Hibernia Bank Building,  
New Orleans, Louisiana.*

"AMERICAN FORESTRY is a very interesting and instructive paper. I enjoy reading it as much as a Forester does."

I. D. VAN VALKENBURG,  
*Johnstown, N. Y.*

"The magazine has improved wonderfully during the past year, and I believe the Association has also become more effective than ever."

H. R. CHRISTIE,  
*Forest Branch, Victoria, B. C., Canada.*

"Am delighted with AMERICAN FORESTRY, which gets better and better month by month. Here's wishing you every satisfaction and success in your work this year."

J. R. DICKSON,  
*Forest Branch, Ottawa, Canada.*

"We congratulate you upon the magazine you are editing."

EVERITT G. GRIGGS,  
*President, St. Paul & Tacoma Lumber  
Company, Tacoma, Washington.*

"I just can't resist wanting to reproduce your whole magazine every time a copy reaches my desk, all of the stories are so interesting. We are reprinting the extracts in all our editions—English, Spanish, Portuguese and French—so you can see that AMERICAN FORESTRY is spreading its good work over the entire hemisphere."

FRANKLIN ADAMS,  
*Editor, Pan-American Bulletin,  
Pan-American Bldg., Washington, D. C.*

"I have for some years been reading your magazine, AMERICAN FORESTRY, and the insight on forest conditions in this country and subjects relative to them has amply repaid me."

ROBERT H. FORMAN,  
*Washington, D. C.*

"Surely you are to be complimented and congratulated on the wonderful improvement that you have brought about in the AMERICAN FORESTRY MAGAZINE. Each number for the past year has shown a marked advance, but your last number stands out as the most readable and most attractive magazine one would want to pick up."

E. CASSIDY,  
*Philadelphia, Pa.*

"We read your magazine every month, and we are very much pleased with it and congratulate you on the work you are doing."

GEORGE W. HARTZELL,  
*President of the George W. Hartzell  
Lumber Company, Piqua, Ohio.*

"Permit me to congratulate you upon the very great improvement that you have given your readers in the late issues of your magazine. It has so many excellent, helpful and inspiring features I cannot begin to enumerate them; I can only express my sense of deep personal gratification and approval and wish you unbounded success such as your efforts truly merit. I gladly endorse every word and sentiment so beautifully expressed by Mrs. Emmons Crocker in a recent edition."

CHARLES S. MANN,  
*Hatboro, Pa.*

### Book Reviews

Irrigation in the United States, by Ray Palmer Teele, 253 pages. Price \$1.50. D. Appleton & Company.

Because of the poverty of authentic information for the prospective land buyer, the purchase of advertised irrigated lands or irrigation securities has been looked upon as a doubtful venture. Realizing the great need of reliable information on the subject, Mr. Teele, who has been connected with the U. S. Government's investigations of irrigation for sixteen years, has prepared this book for the benefit of persons contemplating settlement in the arid sections of the country, and in its provides just the information the prospective settler should have. The author discusses climate, water supply, crops, laws, water rights, securities, organization, and finances, all from the standpoint of the intending purchaser of lands, water rights or securities. The book contains also a large amount of statistical matter relating to irrigation taken from the report of the thirteenth census and other Government reports, showing the results of the various Federal and State laws relating to irrigation, such as the desert land law, Carey Act, reclamation law, and irrigation district laws.

The Holy Earth, by L. H. Bailey. 171 pages. Price, \$1. Charles Scribner's Sons.

Dr. Bailey, of Cornell University, contributes another volume to the series of valuable books from his pen. In this he presents his personal views, formed by many years of thought, study, and contact, of man's relation to the soil, both physical and spiritual. That is, he treats of the practical questions involved, such as the conservation of resources and the like, but in such a way as to arouse the sense of the basic character of nature with respect to intellectual and spiritual as well as physical life; and to do this he reveals rare poetic gifts of vision and expression, employing them in such a way as to make the reader not only understand but feel the truth.

A Thousand Years of Russian History. By Sonia E. Howe. J. B. Lippincott Co., Philadelphia. Price, \$2.50.

The authoress, who is a Russian by birth, the wife of an English clergyman, and a prominent member of the Russian society, offers in this volume a review of Russian history dealing with civic and national life, as well as with the political annals of the empire and its rulers; a connected series of pictures of the Russian nation at various stages of its growth, drawn in the hope of interesting readers in the real story of Russia's past. The numerous illustrations, in color and by a special gravure process, have been carefully selected from the archeological treasures of Russian libraries, in order to illustrate, as far as possible from contemporary sources, the life, manners, and customs of the people, while the territorial growth of the empire is illustrated by a series of maps.

# Canadian Department

BY ELLWOOD WILSON

Secretary, Canadian Society of Forest Engineers

Mr. H. R. MacMillan is now in Calcutta, India, investigating conditions and markets and will proceed from there to China and Japan.

Mr. R. H. Campbell writes that the activities of the Dominion Forest Branch will continue along the same lines as last season.

A. H. Unwin, of England, writes that he is going to Nokling, via Lagos Nigeria, Africa, for the next twelve months.

B. K. Ayers writes from Ansonia, Connecticut, where he is forester for the Ansonia Forest Products Company: "That circular letter should prove a good idea. Business is very good with us, particularly so on account of embargoes on the N. Y., N. H. & H. R. R. which shuts out lumber shipments from connecting lines both north and south. There is an immense volume of war business in this immediate section, as there are large brass mills of all sorts outside of the strictly munition works of Winchester and Marlin at New Haven, Remington and Lake Torpedo at Bridgeport, and Colt's at Hartford. The whole Naugatuck Valley is one large brass center and is working overtime. At the same time that prices are good and orders plenty for lumber, wages have increased for both teams and men."

R. C. Sweezy writes from the Royal Military College at Kingston that he is carrying on a detailed survey for M. J. O'Brien in the Upper Ottawa, area 1,125 square miles and that he gets away occasionally from his military duties to see how his parties are progressing. Recently he made a brief examination of the limits of the Mattagami Pulp and Paper Company in Northern Ontario.

G. H. Gutchess, superintendent of The New York State Ranger School, has resigned, and will return to the Dominion Forest Service.

P. Z. Caverhill, forester for the Province of New Brunswick, is preparing his plans for a forest survey of that province and has mapped out a most excellent scheme. Mr. Caverhill will make a trip to Grande Mere in April.

R. R. Bradley, of the New Brunswick Railway Company is preparing his final maps of the territory owned by that company, and expects, in the spring, to undertake planting operations on a large scale.

Henry Sorgius, manager of the St. Maurice Forest Protective Association, made a trip to Michigan to attend the meeting of the Northern Forest Protective Association. Sorgius is very busy with his plans for the season's work and is equipping a gasoline speeder and a Ford automobile with the new pump designed by Mr. Johnson, of the Dominion Railway Commission. Circulars are also being sent out to the settlers explaining to them the changes in the fire laws and asking their cooperation.

Ellwood Wilson is going to Syracuse on April 1 to lecture to the students of The New York State College of Forestry.

A. C. Volkmar, forester of the Riordan Paper Company, St. Jovite, Quebec, has been elected an associate member of the Canadian Society of Forest Engineers.

Roy L. Campbell, secretary of the Canadian Pulp & Paper Association, did a great deal to make their last meeting the wonderful success it was.

George Chahoon, Jr., president of the Laurentide Company, Ltd., is going to spend the month of April with F. A. Sabbation, vice-president of the Laurentide Power Company, at Hot Springs, Virginia. Mr. Chahoon is an enthusiastic golfer, and Mr. Sabbation is a tennis player of no mean order.

B. M. Winegar, of the C. P. R., reports that he will begin the planting of trees for snow sheds along the eastern lines of that road.

Arnold Hanssen, of the Laurentide Company, Ltd., has been busy all winter clearing off the flood basin of the River St. Maurice, about to be flooded by the company's new dam, hauling the wood and trying to dispose of it to the best advantage.

Prof. R. B. Miller, of the University of New Brunswick, has been getting out some very creditable reconnaissance maps made by his students.

H. R. Christie, of B. C., is going to Ottawa for the purpose of enlisting.

In the issue of "El Correo Espanol" of March 7, published in Madrid, there is an article commenting on the scarcity of paper and urging the founding of a Forest Products Laboratory modeled on that at McGill, to which it pays high tribute.

# Current Literature

## MONTHLY LIST FOR APRIL, 1916

(Books and periodicals indexed in the library of the United States Forest Service.)

### FORESTRY AS A WHOLE

*Proceedings and reports of associations, forest officers, etc.*

British Columbia—Dept. of lands—Forest branch. Report for the year ending December 31, 1915. 56 p. Victoria, B. C., 1916.

Connecticut—State forester. Eighth report, 1915. 40 p. maps. New Haven, Conn., 1916.

India—Baluchistan—Forest dept. Progress report of forest administration for 1914-15. 32 p. Calcutta, 1915.

India—Bihar and Orissa—Forest dept. Annual progress report on forest administration for the year 1914-15. 56 p. Patna, 1915.

India—Jammu and Kashmir—Forest dept. Progress report of forest administration for the year 1914-15. 81 p. Lahore 1915.

India—Madras presidency—Forest dept. Annual administration report for the twelve months ending June 30, 1915. 171 p. Madras, 1915.

India—Northwest frontier province. Progress report on forest administration for the year 1914-15. 44 p. Peshawar, 1915.

Indiana—State board of forestry. Fifteenth annual report. 168 p. il. Indianapolis, 1915.

Ontario—Dept. of lands, forests and mines. Report for the year ending October 31, 1915. 89 p. il. Toronto, 1916.

Sweden—Domänstyrelse. Förvaltning ar 1912. 163 p. Stockholm, 1914.

Sweden—Forstliche versuchsanstalt. Mitteilungen, heft 12, 1915. 189 p. il. Stockholm, 1916.

Vermont—State forester. Seventh annual report, 1915. 55 p. pl. St. Albans, 1915.

### Forest Education

#### Forest schools

Yale forest school. Summer camp for young men, Milford Pike County, Pa., under the auspices of the Yale school of forestry. 8 p. il. New Haven, Conn., 1916.

#### Arbor day

Indiana—State board of forestry. Indiana centennial patriotic arbor and bird day manual. 54 p. il. Indianapolis, 1916.

Ohio—Dept. of public instruction. Arbor and bird day manual. 96 p. il. Columbus, Ohio, 1916.

#### Woods: classification and structure

Prichard, Reuben P. The structure of the common woods of New York and the wood collection distributed by the college of forestry. 31 p. il. Syracuse, N. Y., 1915. (New York state college of forestry, Syracuse university. Bulletin, v. 15, no. 3.)

**Forest Influences**

Mougin, Paul. *Les torrents de la Savoie*. 1,251 p. pl., maps. Grenoble, J. Besson, 1914.

**Silviculture***Planting and nursery practice*

Barnard, W. D. Forest planting in Wisconsin. 34 p. il. Madison, Wis., 1916. (Wisconsin-Conservation commission. Bulletin 1.)

MacDonald, G. B. Renewing the shelter belt. 16 p. il. Ames, Iowa., 1916. (Iowa-Agricultural experiment station. Circular no. 27.)

Scott, Charles A. Trees for Kansas. 19 p. il. Manhattan, Kans., 1916. (Kansas-Agricultural experiment station. Circular 55.)

Stewart, V. B. Dusting nursery stock for the control of leaf diseases. 12 p. il. Ithaca, N. Y., 1916. (Cornell university—Agricultural experiment station. Circular 32.)

**Forest Protection***Insects*

Patch, Edith M. Woolly aphid of elm and juniper. 8 p. il. Orono, Me., 1915. (Maine—Agricultural experiment station. Bulletin 241.)

Swaine, J. M. (1) A new species of Pityogenes, by J. M. Swaine. (2) Observation on the life history and habits of Pityogenes hopkinsi Swaine, by M. W. Blackman. 66 p. pl. Syracuse, N. Y., 1915. (New York state college of forestry, Syracuse university. Technical publication no. 2.)

*Diseases*

Meinecke, E. P. Forest pathology in forest regulation. 63 p. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Bulletin 275.)

*Fire*

Black, Robson. The boy scout's forest-book. 31 p. il. Ottawa, Canadian forestry association, 1916.

Cox, Wm. T. Railroad fire prevention. 29 p. il. St. Paul, Minn., 1914. (Minnesota—Forestry board. Bulletin no 2.)

Kennebec valley protective association. Fourth annual report. 16 p. Bingham, Me., 1916.

Kennebec valley protective association. A manual for the use of lumbermen, woodsmen and sportsmen. 32 p. il. Bingham, Me., 1916.

**Forest Management**

Tillotson, C. R. The care and improvement of the wood lot. 24 p. il. Wash., D. C., 1916. (U. S.—Dept. of agriculture. Farmers' bulletin 711.)

**Forest Legislation**

Michigan—Laws, statutes, etc. An act to encourage private forestry, the care and management thereof, and to provide for the exemption from taxation of such private forest reserves. 3 p. Lansing, Mich., 1913. (Michigan—Public domain commission. Bulletin no. 2.)

**Forest Utilization***Wood using industries*

Greig, A. R. & Shaw, A. M. Beef cattle barns for prairie farms. 51 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 3. Farm buildings series.)

Greig, A. R. & Shaw, A. M. Combination barns for prairie farms. 54 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 1. Farm buildings series.)

Greig, A. R. Dairy barns, ice and milk houses for prairie farms. 65 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 2. Farm buildings series.)

Greig, A. R., & Shaw, A. M. Horse barns for prairie farms. 50 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 4. Farm buildings series.)

Greig, A. R. Houses for prairie farms. 70 p. il. Victoria, B. C., 1916. (British Columbia—Dept. of lands—Forest branch. Bulletin 10.)

Greig, A. R., & Shaw, A. M. Implement sheds and granaries for prairie farms. 38 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 8. Farm buildings series.)

Greig, A. R. & Shaw, A. M. Piggeries and smoke house for prairie farms. 38 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 6. Farm buildings series.)

Greig, A. R. Poultry houses for prairie farms. 35 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 7. Farm buildings series.)

Greig, A. R. Sheep barns for prairie farms. 34 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 5. Farm buildings series.)

Greig, A. R. Silos and root cellars for prairie farms. 38 p. il. Victoria, B. C., 1915. (British Columbia—Dept. of lands—Forest branch. Bulletin no. 9. Farm buildings series.)

*Forest by-products*

Benson, H. K. By-products of the lumber industry. 68 p. il. pl. Wash., D. C., 1916. (U. S.—Dept. of commerce—Bureau of foreign and domestic commerce. Special agents series no. 110.)

**Wood Technology**

Armstrong, A. K. Greenheart: a timber with exceptional qualities. 7 p. N. Y., Engineering record, 1916.

British Columbia—Dept. of lands—Forest branch. British Columbia Douglas fir dimension. 15 p. il. Victoria, B. C., 1916. (Bulletin 14.)

British Columbia—Dept. of lands—Forest branch. British Columbia western soft pine. 15 p. il. Victoria, B. C., 1916. (Bulletin 17.)

Lazenby, Wm. R. Qualities and uses of the woods of Ohio. 37 p. il. Columbus, Ohio, 1916. (Ohio—Biological survey. Bulletin 6.)

**Auxiliary Subjects***Botany*

Bray, Wm. L. The development of the vegetation of New York state. 186 p. il, map. Syracuse, N. Y., 1915. (New York state college of forestry, Syracuse university. Technical publication no. 3.)

*Parks*

Cox, Wm. T. The source of the father of waters. 20 p. il. St. Paul, Minn., 1914. (Minnesota—Forestry board. Bulletin no. 3.)

*Erosion*

Baker, F. R. The prevention and control of erosion in North Carolina, with special reference to terracing. 27 p. il. Raleigh, N. C., 1916. (North Carolina—Agricultural experiment station. Bulletin 236.)

*Drainage*

Minnesota—State drainage commission. Report of the state drainage commission of Minnesota. 66 p. pl., maps, diagr. St. Paul, 1915.

Minnesota—State drainage commission. Report of the water resources investigation Minnesota, 1911-12. 602 p. and atlas. pl., diagr., maps. St. Paul, 1912.

Minnesota—State drainage commission. Report on drainage work in Minnesota. 214 p. il, diagr. St. Paul, 1913.

Palmer, Ben. Swamp land drainage with special reference to Minnesota. 138 p. Minneapolis, 1915. (Minnesota, University of. Studies in the social sciences, no. 5.)

**Periodical Articles***Miscellaneous periodicals*

American city, Feb., 1916.—Value of the linden as a street tree. by E. H. Bennett, p. 191-2.

American journal of botany, Jan., 1916.—Notes on the anatomy of *Peridermium* galls, by Alban Stewart, p. 12-23.

Country life in America, April, 1916.—The biggest trees, barring the conifers, p. 32-3.

Garden magazine, March, 1916.—Types of the black walnut, by Archibald Rutledge, p. 120.

Gardeners chronicle, March 11.—Charcoal, p. 152.

Harper's weekly, Dec. 25, 1915.—Why are national forests? by W. P. Lawson, 616-17.

Journal of accountancy, Feb., 1916.—Logging in western Washington, by W. Jensen, p. 125-35.

National wool grower, March, 1916.—Lambing methods in national forests of southwest, by Robert R. Hill, p. 7-10; Our remaining public lands, by Dwight B. Heard, p. 34-7; The brome grasses, by Arthur W. Sampson, p. 38-40.

Outing magazine, Jan., 1916.—Day with the Forest service, by J. A. Cope, p. 405-8.

Outlook, Dec. 22, 1915.—Break your match in two, by T. H. Simpson, p. 971-8.

Outlook, Feb. 2, 1916.—Pine blister rust, p. 254-5.

Outlook, March 22, 1916.—The Alaskan forests: an interview with Henry S. Graves, the United States forester, by L. M. Lamm, p. 679-82.

Overland monthly, Dec., 1916.—Monterey cypress, by L. Kothe, p. 469-73.

Overland monthly, Jan., 1916.—Giant trees of Sequoia, by H. Rankin, p. 75-80.

Overland monthly, Feb., 1916.—In a Forest service camp, by C. E. O'Brien, p. 146-52.

Plant world, March, 1916.—The weight of physical factors in the study of plant distribution, by Forrest Shreve, p. 53-67; Notes on the ancestry of the beech, by Edward W. Berry, p. 68-77.

Proceedings of the Pan-American road congress, 1915.—Road-building in the national forests, by Henry Solon Graves, p. 43-50.

Reclamation record, March, 1916.—Tree planting: Yakama project, Wash., p. 125.

Reclamation record, April, 1916.—How national forest administration benefits water users, p. 170-1; A cooperative sawmill, by H. L. Hull, p. 173-5.

Rhodora, Feb., 1916.—The name of the red oak, by C. S. Sargent, p. 45-8.

Scientific American, March 25, 1916.—Our vanishing export trade in the products of American forests, p. 319, 334.

United States—Dept. of agriculture, Journal of agricultural research, April 10, 1916.—Oviposition of *Megastigmus spermotrophus* in the seed of Douglas fir, by J. M. Miller, p. 65-8.

United States—Dept. of agriculture. Weekly news letter, March 29, 1916.—Wood ashes and bone meal contain all the necessary constituents of a complete fertilizer, p. 2.

United States—Dept. of agriculture. Yearbook, 1915.—Pointers on marketing woodlot products, by Stanley L. Wolfe, p. 121-30; Osage orange waste as a substitute for fustic dyewood, by F. W. Kressman, p. 201-4.

World's work, April, 1916.—A new west: the attempts to open up the natural treasures of the western states; utilization and conservation vs. monopolistic greed; the Dept. of the interior, by James Middleton, p. 669-80.

*Trade journals and consular reports*

American lumberman, March 18, 1916.—Authorities say wood block is best paving, p. 32; How to build and operate a saw-mill, by L. L. Shertzer, p. 33-36.

American lumberman, March 25, 1916.—Railway engineers discuss utility of wood, p. 40-1.

American lumberman, April 1, 1916.—Railroad aids reforestation, p. 32; Forest exhibits comprehensive; government has good showing at California fair, p. 33; Making by-products investigation: Forest products laboratory giving special attention to new manufactures of wood, p. 33.

American lumberman, April 8, 1916.—Utilizing osage orange for dye, p. 31; South Africa needs lumber: most of native product unfit to be sawed, p. 42; Nova Scotia forests decrease: have timber supply for only sixty years, p. 42; How war has affected Italy's lumber supply, p. 43; Timber importations by France are light, p. 51; Britain pays high for lumber, p. 56.

Barrel and box, March, 1916.—Butter packing in Ireland, p. 75-6; Statistics of the American veneer industry, p. 93; The wooden handle trade, p. 94; The shoe peg business, p. 94; Manufacture of woodenware and novelties, p. 95; Excelsior industry, p. 96; Manufacture of matches, p. 96; Manufacture of tobacco pipes, p. 96; Woods used for specialties; American wooden toys, p. 97; The toothpick business, p. 97.

Canada lumberman, Feb. 15, 1916.—Structural qualities of British Columbia fir, by H. R. MacMillan, p. 28-30; Variation in weight and strength of timber, by J. A. Newlin, p. 34-5; Central British Columbia forests, p. 35.

Canada lumberman, March 15, 1916.—Market for Canadian timber in France, by H. R. MacMillan, p. 28-9; Briquetting of sawdust on a commercial basis, by R. Thelan, p. 39-40; Utilizing wood waste in the paper industry, by E. B. Biggar, p. 50.

Canada lumberman, April 1, 1916.—Canadian timber trade in South Africa, by H. R. MacMillan, p. 28-31; Increasing use of treated wood block, by W. G. Mitchell, p. 34-5; Opportunities for Canadian lumber in France, p. 38; Wooden goods for South Africa, p. 38; British Columbia's fine finish materials, p. 38-9; Making bungs and faucets, p. 40-1; The shoe peg business, p. 52.

Engineering news, Dec. 23, 1915.—Continuous wire winding for wood-stave pipes, p. 1210-11; Monumental timber building endangered by rot, p. 1221.

Engineering news, Feb. 3, 1916.—Causes of failure in creosoted wood-block pavement, p. 204-6; Why the Seattle wood-stave water pipe failed, by R. H. Ober, p. 242-4.

Engineering record, April 8, 1916.—Test Douglas fir stringers; new method of creosoting, p. 479; How the Forest service bridges the more remote stream crossings, p. 485.

Hardwood record, April 10, 1916.—Steam specialties in saw mills, by Anthony S. Hill, p. 16-17; English and French timber trade, p. 18; Wood for tobacco pipes, p. 18; Practical mahogany planting, p. 19-20; Saving waste by using it, p. 22-3; Oil of wintergreen, p. 23.

Holzwelt, Dec. 10, 1915.—Von den eigenschaften des holzes, by P. Martell, p. 5.

Holzwelt, Jan. 7, 1916.—Trocknungsanlagen für die holzbearbeitung, by Fred Hampe, p. 15.

Holzwelt, Feb. 4, 1916.—Ueber das verblauen des kiefernholzes, by A. Schwappach, p. 1-2.

New York lumber trade journal, March 15, 1916.—National canners and national grocers specify lumber for boxes, p. 20.

Paper, March 15, 1916.—The manufacture of paper pulp from straw, p. 18-19.

Paper, March 22, 1916.—Modern developments in pulp and paper, p. 11-15.

Paper, March 29, 1916.—The Swedish wood-pulp industry, p. 11-17.

Paper, April 12, 1916.—Woodpulp manufacturing processes, by Allan Smith, p. 11-16; The paper pulp of the future: lumber shortage leads to speculation concerning new sources of raw material, by P. Ebbinghaus, p. 17.

Paper mill, Feb. 19, 1916.—Planting forests for profit in Canada, by Ellwood Wilson, p. 164-6; How paper is made by hand in the Orient, p. 170-2.

Paper mill, March 25, 1916.—American trees in Norway, p. 34.

Paper trade journal, March 9, 1916.—The origin and development of paper making in the old world, by Albert Komp, p. 35, 38, 44, 46.

Philippine trade review, Dec., 1915.—Timber market in China, p. 6-8.

Philippine trade review, Feb., 1916.—Uses of Philippine woods, p. 7-10.

Pulp and paper magazine, Feb. 15, 1916.—Some valuable conditions affecting the manufacture of ground wood, by G. W. Dickson, p. 83-4.

Pulp and paper magazine, March 1, 1916.—Review of the paper textile industry, p. 103-6; Proper reforestation, by Ralph H. McKee, p. 106-7; Important points in the manufacture of ground wood, by A. O. Bowness, p. 107-9.

St. Louis lumberman, March 1, 1916.—Mount Mitchell forest to be opened to the public, p. 16; Cost economics, by Robert B. Goodman, p. 70-1.

St. Louis lumberman, March 15, 1916.—Lumber trade conditions; the average F. O. B. mill prices for eleven months, or from April, 1915, to Feb., 1916, inclusive, p. 42-4; List of associations and officers, p. 62-3.

Southern lumberman, April 1, 1916.—Sanitary handling of timber, by C. J. Humphrey, p. 39-40.

Timber trade journal, March 4, 1916.—Prevention of breakage in felling, p. XIII.

Timberman, March, 1916.—New principle in spark arrester, p. 32M; Average cost of manufacturing fir lumber, by Austin Cary, p. 46-7.

United States daily consular report, March 21, 1916.—Canadian offer benefits American lumber company, by R. M. Newcomb, p. 1122-3.

United States daily consular report, March 23, 1916.—Need of lumber in Italy, p. 1155.

United States daily consular report, March 24, 1916.—The timber trade of France, p. 1178-80.

United States daily consular report, March 27, 1916.—Conditions in the French lumber trade, p. 1188; Lumber market of South Africa, p. 1209-12; Imports of chicle for chewing-gum manufacture, p. 1213.

United States daily consular report, March 28, 1916.—Rattan-furniture industry at Hongkong, by Leroy R. Sawyer, p. 1222-3.

United States daily consular report, March 30, 1916.—Norwegian pulp situation, by A. G. Schmedeman, p. 1249; Dye-

## AMERICAN FORESTRY

woods in the Dominican republic, by Carl M. F. von Zielinske, p. 1254-5.  
United States daily consular report, April 1, 1916.—Lumber shipments from Pacific ports, by W. B. Henderson, p. 1.

United States daily consular report, April 5, 1916.—Douglas fir tested by British railway, p. 55.

Veneers, April, 1916.—Mahogany and their characteristics, by G. D. Crain, p. 11-12; Those very thin Japanese veneers, by H. W. M., p. 17.

West Coast lumberman, March 15, 1916.—Production and consumption of forest products in Pacific northwest, by Clark W. Gould, p. 30-1, 87; Lumber; Pacific northwest cargo shipments for the past 22 years, p. 34-5; Douglas fir saw mill waste can be used in manufacture of producer gas, p. 38; Well-known forester presents standing timber case to Federal board, by E. T. Allen, p. 41; How Washington timber is taxed, p. 43; Creosoting by new process strengthens and increases life of Douglas fir, by O. P. M. Goss, p. 47; Pioneer days of lumber manufacturing in territory of Washington, by Grace Pulliam, p. 81, 86.

West Coast lumberman, April 1, 1916.—English railway officials announce amazing results for fir tie tests, p. 21, 30; Wood waste alcohol vs. gasoline, p. 36; University of Washington to stage exhibit of interest to lumbermen, p. 28; Italy as a lumber market, p. 30; France not a big importer, but consumes more lumber than England, by H. R. MacMillan, p. 36.

Wood turning, April, 1916.—The helve maker, by Samuel J. Record, p. 5-7.

## Forest journals

Allgemeine forst- und jagd-zeitung, Oct.-Nov., 1915.—Zur schätzung des festgehalts von bäumen und rund-hölzer, by Robert Fischer, p. 225-34; Zwei Wimmenauer-sche höhenmesser, by Hemmann, p. 234-9; Fichtenlohrinde, by Wiener, p. 240; Die besteuerung der waldungen, by Karl Friedrich Wimmenauer, p. 247-51.

Forest leaves, April, 1916.—The flora of Surinam, by T. B. Purcival, p. 115-17; The state forest academy, by J. T. Rothrock, p. 119-21; Silviculture for Pennsylvania, by George A. Retan, p. 122-7.

Forestry quarterly, March, 1916.—An efficient system for computing timber estimates, by C. E. Dunston and C. R. Garvey, p. 1-2; Concerning site, by Filibert Roth and H. A. Parker, p. 3-13; Silvicultural problems of Canadian forest reserves, by B. E. Farnow, p. 14-23; The costs and values of forest protection, by P. S. Lovejoy, p. 24-38; Making box boards from sawmill waste, by P. L. Buttrick, p. 39-45; Teaching dendrology in the Hawaiian Islands, by Vaughan MacCaughey, p. 46-9; Forest provisions of New York State constitution, by C. R. Pettis, p. 50-60; The professional and economic situation of the technical

forester as seen by the forester in Switzerland, by R. H. Campbell, p. 61-5; The Algerian forest code, by T. S. Woolsey, Jr., p. 66-80.

Forstwissenschaftliches centralblatt, Feb., 1916.—Der gang des hohenwachstums in jungen fichtenbeständen im Jahre 1913 un die begleitenden bedingungen, by Nachtigall, p. 61-77.

Hawaiian forester and agriculturist, March, 1916.—Arbor day in Hawaii, Nov. 19, 1915, by C. S. Judd, p. 78-80.

Indian forester, Jan., 1916.—Suggestions for a new system of royalty payment for teak forests in Burma, worked by lessees under purchase contract, p. 1-4; Teak working-plans in Burma, by H. W. A. Watson, p. 4-17; Teak wood, by S. F. Hopwood, p. 18-22; An administrative aspect of the coppice-with-standard working in the Bhandara forest division, C. P., by M. Narasinga Rao, p. 23-7; Pterocarpus santalinus; some observations regarding reproduction, germination and growth of seedlings, by Saiyid Abdul Qadir, p. 27-33; Sandalwood: its parasitic habit, by K. G. M., p. 33-4;



*"This prevents wood from warping!"*

"THIS hardwood trim won't warp, shrink, or twist out of shape because I am protecting it against dampness in the plaster wall with a coating that makes protection absolutely sure."

Ordinary metallic paints *coat*, but they don't *protect*. The alkali in the wall masonry makes them saponify and become useless.

**R.I.W. TRIMBAK**

on the other hand, can't possibly saponify. It remains a perfect protection, permanently.

Used in a luxurious down-town club, the Woolworth Building, the Metropolitan Tower, the Bankers' Trust Co., and other prominent places.

Full details upon request from Department I.

**TOCH BROTHERS**

Established 1848

Inventors and manufacturers of R. I. W. Paints, Compounds, Enamels, etc.

320 Fifth Avenue, New York City

Works: New York, London, England and Toronto, Canada

**You Can Save That Tree**

By using  
**HOYT'S  
TREE REPAIR  
MATERIALS**

The only correct way of filling tree cavities is by the Asphalt Briquette Method and the Use of Anti-septic Tree Varnish. Write for freefolders on tree repair.

**C. H. HOYT**  
410 Citizens Building  
Cleveland, Ohio

**Miniature Construction**

Landscape and Architectural Models  
Topographical Maps and Paintings  
for  
SCHOOLS—COLLEGES—MUSEUMS  
Government work a specialty

**MORGAN BROS. CO., Inc.**  
**Model Makers**

Room 1650 Grand Central Terminal  
Phone 7720 Murray Hill NEW YORK CITY

The opening of the buildings of the Madras forest college, p. 34-40; Propelling power from wood-pulp, by Walter F. Reid, p. 41.

Naturwissenschaftliche zeitschrift für forst- und land-wirtschaft, Jan., 1916.—Die europäischen Dipriomarten, by E. Enslin, p. 1-20; Veränderlichkeit der forstlichen bodenbonität, by Bernbeck, p. 20-7; Ueber seidengewinnung, by J. Dewitz, p. 27-36; Ueber jahresringbreiten und alter der bergkiefern, by Karl Müller, p. 36-42; Die von parasiten bewohnten grünen inseln vergilbender blätter, by Carl von Tubeuf, p. 42-46.

Naturwissenschaftliche zeitschrift für forst- und land-wirtschaft, Feb., 1916.—Karl Eduard Ney, by Münch, p. 51-3.

North woods, March, 1916.—In regard to the efficiency of an aeroplane and ability of a pilot in locating forest fires, by F. B. Moody, p. 25-7.

Proceedings of the Society of American foresters, Jan., 1916.—Forest service silviculture plans, by Theodore S. Woolsey, Jr., p. 1-16; The utilization of a tropical forest, by George Patrick Ahern, p. 17-26; Notes on forest cover and snow retention on the east slope of the forest range in Colorado, by Norman De Witt Betts, p. 27-32; Chemistry as an aid in the identification of species, by A. W. Schorger, p. 33-9; Forests have a vital interest in the white-pine blister rust, by Perley Spaulding, p. 40-7; The American forester: his opportunities, by Coert DuBois, p. 48-51; Professional ethics, by B. E. Fernow, p. 52-8; The American forester: What the Society has done and may do for him, by D. T. Mason, p. 59-65; The forester's duty towards lumbering, by George M. Cornwall, p. 66-74; The place of logging engineering in forestry, by Judson F. Clark, p. 75-8; The lumberman's duty toward forestry, by Frederick E. Olmsted, p. 79-83; Working plans on national forests, by W. B. Greeley, p. 84-5; Weight of western yellow pine logs in Arizona, by Theodore S. Woolsey, Jr., p. 85-6; The stability of aspen as a type, by Arthur W. Sampson, p. 86-7; Notes on trees, by W. W. Ashe, p. 88-96; Annual meeting of the Society of American foresters, p. 105-54; Abraham Knechtel, by Clyde Leavitt, p. 155; Members of the Society of American foresters, and constitution as amended to date, p. 156-70.

Yale forest school news, April 1, 1916.—The place of silviculture in the utilization of our forests, by Raphael Zon, p. 19-21; Michigan forestry school, by Filibert Roth, p. 22.

Zeitschrift für forst- und jagdwesen, Nov., 1915.—Die waldsamenprüfungsanstalt Eberswalde und die methoden der prüfung von waldsamen, by Adam Schwappach, p. 631-51.

## Relative Values

*Send for our booklet  
"Home Landscape"*

ISAAC HICKS & SON  
Westbury .. Nassau County .. New York

¶ A beautiful house on a bare plot loses caste. It lacks a natural setting.  
¶ Nature requires time to remedy it.

¶ By setting out grown trees and shrubs you can

### SAVE TEN YEARS

and enjoy a well-shaded harmonious home at once.

## Our Trees

### HOW TO KNOW THEM

Photographs from Nature  
By ARTHUR I. EMERSON

WITH A GUIDE TO THEIR RECOGNITION AT ANY SEASON OF THE YEAR AND NOTES ON THEIR CHARACTERISTICS, DISTRIBUTION AND CULTURE

By CLARENCE M. WEED, D.Sc.  
Teacher of Nature Study in the Massachusetts State Normal School at Lowell

One hundred and forty illustrations  
Size of book, 7½ inches by 10 inches

Cloth, \$3.00 net      Postage extra

ALL nature-lovers will hail this book with delight. Its purpose is to afford an opportunity for a more intelligent acquaintance with American trees, native and naturalized. The pictures upon the plates have in all cases been photographed direct from nature, and have been brought together in such a way that the non-botanical reader can recognize at a glance either the whole tree or the leaves, flowers, fruits, or winter twigs, and thus be able to identify with ease and certainty any unknown tree to which his attention may be called. In the discussion of the text especial attention has been given to the distinguishing character of the various species, as well as to the more interesting phases of the yearly cycle of each, and the special values of each for ornamental planting.

Publishers

J. B. LIPPINCOTT COMPANY  
Philadelphia

## Seeds for Forestry Purposes

We offer a most complete list of both Deciduous and Evergreen Tree and shrub seeds for forestry purposes.

### Seeds That Are of Best Germinating Quality

Our catalog contains a full list of the varieties we offer, which include the best and most rare species. Send for a copy, it will interest you.

THOMAS MEEHAN & SONS  
Wholesale Nurserymen and Tree Seedmen  
DRESHER, PENNA., U. S. A.

### "THE BEST MADE"



### HIGH GRADE PRINTING PAPERS

DILL & COLLINS Co., Papermakers  
PHILADELPHIA

Correspondence Solicited

### Nursery Stock for Forest Planting

Seedlings	TREE SEEDS	Transplants
\$2.25		\$6.00
per 1000	Write for prices on large quantities	per 1000

THE NORTH-EASTERN FORESTRY CO.  
Cheshire, Conn.

## FORESTERS ATTENTION

AMERICAN FORESTRY will print free of charge in this column advertisements of foresters wanting positions, or of persons having employment to offer foresters

**WANTED**—Work during the summer by a young man starting to study forestry. Would accept place of any kind where practical experience could be obtained. Free June 15. Best of references. Address W. W. J., care of AMERICAN FORESTRY, Washington, D. C.

**WANTED**—Position by Forester, graduate of one of the best Forestry Schools, six years' course, five years' experience in the East and West, including U. S. Forest Service, private and teaching work; considerable experience in organization of work and men; special preparation and ability for investigative work in silvics and silviculture. Open for engagement in teaching or field work in the East. Can take charge of city forestry or private estate work. Best references. Personal interview possible. At present employed. Address Box 34, care of AMERICAN FORESTRY, Washington, D. C.

**POSITION**—Young man (33), single, seven and a half years' technical training. Will consider position as City Forester, Park Superintendent, Superintendent of Private Estate or Consulting Landscape Architect for railroad. Education consists of post-graduate work in prominent middle-western school of forestry, supplemented by several years post-graduate work in recognized school of landscape design in the East. Experienced in public and private forestry, including work in the Forest Service, the various phases of municipal forestry such as extension work, and tree surgery; and also the designing of parks, playgrounds, and private estates. References given and required. Address XYZ, care of AMERICAN FORESTRY.

**WANTER**—Forester with practical forestry experience in reforestation and the handling of second growth timber products; preferably one who has also some knowledge of management of game preserves. Must have two to four thousand dollars capital and first-class references. Situation on large acreage in Maryland. Address "W. M. O.", care of AMERICAN FORESTRY, Washington, D. C.

**RANGER** desired position. Graduate of the New York State Ranger School at Wanakena, N. Y., age 20 years, weight 160 pounds, habits good, very ambitious. Please address Box 28, care of AMERICAN FORESTRY.

**YOUNG MAN** 24 years old wishes position out West. I have had a two-year course in Forestry in Europe. Have spent over two years in British Columbia. I am willing to work. Write, "Canadian," care of AMERICAN FORESTRY.

**WANTED**—A technical and practical forester and woodman would like a position with lumber company as timber cruiser, surveyor or woods foreman. Best of references. Address Box 33, care of AMERICAN FORESTRY, Washington, D. C.

**MARRIED MAN** with family desires position of trust. Six years' practical experience in Forestry and Nursery work in Germany; twelve years' experience in commerce in Germany, France, England and Canada; wide experience in farming and stock raising in Germany and Canada; four years as Forest Supervisor and Forest Clerk in Canada; first class education and references. Address Jas. Riehle, Forest Clerk, 184 Dunedin Terrace, St. Paul, Minn.

**WANTED**—Position as City Forester, by graduate forester and landscape gardener with experience in each. Presently employed as Assistant City Forester in a city of 700,000 population. Address Box AA, care of AMERICAN FORESTRY.

**GRADUATED** Danish Forester, with nine years' experience, since graduation, in nursery, planting, reforestation and thinning, also in road-building and logging operation, in Denmark, Germany, India and Canada. Highest references as to ability and character. Permanent position wanted with railroad company, private estate, or timber company. At present employed in Government service. Address, A. B., care of AMERICAN FORESTRY, Washington, D. C.

**WANTED**—Position as City Forester or Park Superintendent by graduate forester, experienced in municipal and private forestry work. Presently employed as Assistant Forester in city with population of 147,000. Address, Box 29, care of AMERICAN FORESTRY.

**TREE SURGEON**, with four years' practical experience, wishes position on private estate or with reliable company. Expert on shade tree work and orchard rejuvenation. Conscientious and efficient workmanlike. References. Address H. E. W., care of AMERICAN FORESTRY.

**PRACTICAL WOODSMAN AND FOREST ENGINEER** with thorough experience this country and Europe will take charge of forested estate or game preserve. An expert in managing and improving woodlands, and can show results. Highest references as to character, training, and ability. Address Woods Superintendent, Care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

**GRADUATE FORESTER**, in 1911, from a recognized eastern college. Four years' experience. One year each in Federal and Pennsylvania State Forest Service. One year with Forest Engineering firm, and one year in Municipal Forestry and Arboricultural work. Am prepared and fully equipped for contract or job work, also permanent or temporary position on private estates with a city or corporation anywhere in the United States and at all times. Work includes cruising, mapping, reforestation, thinnings, damage appraisals, logging and fire protection plans. Municipal and Park work such as pruning, planting, designing and reinforcing and repairing defective, decayed and diseased trees. Address Box G, care of AMERICAN FORESTRY, Washington, D. C.

**YOUNG MAN** with thorough training in Arboriculture and Forestry, with experience in Tree Surgery, desires position as assistant city forester, or as tree surgeon with some reliable firm. Address "M. A. C." care of AMERICAN FORESTRY.

**YOUNG man** (28), single, technical education, five years' general engineering experience, as instrument man and computer, on surveys, and as inspector and superintendent on construction. Also field and office experience with U. S. Forest Service. Capable of taking charge of party; desires position with forester or lumber firm. Address Box 32, care of AMERICAN FORESTRY, Washington, D. C.

**ENERGETIC Post Graduate Forester** desires position as an assistant in park or city forestry work. Subordinate duties preferred. Best of references. Address Box 18, care of AMERICAN FORESTRY.

**SCALER**—With actual experience desires position with any lumber company in the United States or Canada. Competent surveyor and mapper, accustomed to roughing it. Present employer best reference. Address "Scaler," care of AMERICAN FORESTRY.

**WANTED**—Position by graduate forester. Experience in Southern Pineries; five years technical training. Prefers South but willing to go anywhere. Address Box 22, care of AMERICAN FORESTRY.

**EXPERT**, graduate of College and University, with eastern and western experience. Has worked and studied several years along, forestry, dendrological and agricultural lines in Germany, Holland, Belgium, Sweden, Norway, Denmark, France, Italy, England and Switzerland. Writes, reads and speaks fluently German, French, Dutch and Swedish. Acquainted with bookkeeping and some tropical forestry. Has first-class references. Wants head position in large company or corporation. Will invest some money if required. Address Box 30, care of AMERICAN FORESTRY.

## FOR SALE

### TIMBER LANDS FOR SALE

For Sale—40,000,000 feet timber, mostly Short Leaf Pine and Southern Cypress; 85 per cent in fee. Seventeen miles standard gauge railroad; 130-acre mill site on deep water; eastern South Carolina. Address "B," 509 East Forty-second Street, Baltimore, Md. 5-6

### LARGE TRACT OF TIMBERLAND FOR SALE IN TENNESSEE

Nine miles from Q. & C. R. R., with water grade from timber to the station.

The timber has been cruised by some of the best cruisers in the country, and they all report that it will cut from two to five per cent more than the estimate following:

The land totals 23,000 acres and has upon it the following number of feet (estimated): 111,000,000 feet of White Pine; 15,000,000 feet of Poplar; 35,000,000 feet of Chestnut Oak and Yellow Pine; and 14,000,000 feet of Hemlock. This timber has never been tapped for turpentine and is all virgin timber.

The price of the whole tract is \$275,000.00.

For further information apply to R. S. Bradley, 1722 H Street, Washington, D. C. 4-5

## 140,000,000 Feet National Forest Timber For Sale

**LOCATION AND AMOUNTS.**—All the merchantable dead timber standing or down and all live timber marked or designated for cutting on an area embracing about 9,000 acres in T. 63 N., surveyed, and approximate T. 64 N., unsurveyed, R. 3 E. B. M., and approximate Ts. 35 and 36 N., unsurveyed, R. 34 W., M. P. M., Deer Creek watershed, Pend Oreille National Forest, Idaho, and Kootenai National Forest, Montana, estimated to be 36,000,000 white pine, 50,000 yellow pine, 40,000,000 spruce, 15,000,000 cedar, 35,000,000 Douglas fir and larch, 4,000,000 white fir, 6,000,000 hemlock, lodgepole and miscellaneous sawtimber feet B. M., logscale, more or less, an unestimated amount of alpine fir, lodgepole pine and spruce timber; 60,000 cedar poles, more or less, together with an unestimated amount of cedar piling, shingle bolts and posts.

**STUMPPAGE PRICES.**—Lo west rates considered, \$3 per M for green and \$1.50 per M for dead white pine; \$2 per M for green and \$1 per M for dead yellow pine; \$1 per M for green and dead Englemann spruce; and 50c per M for all other species green and dead; and for green cedar poles, the following rates: 25' 5", 10c; 25' 6", 15c; 25' 7", 20c; 30' 6", 25c; 30' 7", 30c; 30' 8", 35c; 35' 7", 40c; 35' 8", 45c; 40' 7", 60c; 40' 8", 65c; 45' 7", 70c; 45' 8", 80c; 50' 7", 80c; 50' 8", 85c; 55' 8", 90c; 60' 8", \$1; 65' 8", \$1.10; 70' 8", \$1.20; 75' 8", \$1.30; poles having a top diameter of over 8", same rate as for 8" top; dead cut cedar poles, one-half the rate for green cut; cedar piling 1c per linear foot up to and including 40'; over 40', 1 1/2c per linear foot; cedar shingle bolt material, \$1 per M feet logscale, and 75c per cord; split cedar posts, 25c per hundred; round cedar posts, 7' long, 50c per hundred; round cedar posts over 7' long, 1/2c per linear foot. Prices will be readjusted at the end of the third, seventh, and tenth years.

**PERIOD FOR REMOVAL.**—A period of ten years, in addition to a period of one year for the construction of improvements, will be allowed for the removal of the timber.

**DEPOSIT.**—With bid, \$10,000 to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent may be retained as forfeit if the contract and bond are not executed within the required time.

**FINAL DATE FOR BIDS.**—Sealed bids will be received by the District Forester, Missoula, Mont., up to and including June 5, 1916. The right to reject any and all bids is reserved. Before bids are submitted, full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, Missoula, Mont., or the Forest Supervisor, Sandpoint, Idaho.

BOOKS FREE—See Special Offer to Members under Table of Contents

## Timber Cruising Booklets

**BILTMORE TIMBER TABLES**

Including solution of problems in forest finance.

**SOUTHERN TIMBER TABLES**

How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

**HOWARD R. KRINBILL**  
Forest Engineer      Newburn, N. C.

Books Every Forester, Every School, Every Library Should Have

**Handbook of the Trees of the Northern States and Canada**

By ROMEYN B. HOUGH

Photo, descriptive: In buckram..... \$6.00  
In half morocco..... 8.00

The most ideal handbook of its kind

**American Woods** Illustrated by actual specimens

By ROMEYN B. HOUGH

Issued in parts, each covering 25 species  
In cloth, \$5.00 per part  
In half morocco, \$7.50 per part

A Volume of "American Woods" displayed.

Order from

AMERICAN FORESTRY ASSOCIATION  
Washington, D. C.

## Gain a Member

Help to double our membership and you will aid in doubling the Association's power in the cause of forest conservation



For Greatest Satisfaction Use

**DOUBLE SERVICE  
Automobile Tires**

Guaranteed 7,000 Miles Service

**Absolutely Punctureproof**

Double Service Tires are made double the thickness of the best standard make tires.

This 100% greater wearing surface naturally means much more miles and service. The average of 12 miles of tough fabric and one inch surface tread rubber makes these tires absolutely punctureproof.

These tires exceed all others for use in the country over rough and rugged roads as well as on hard pavements. They are more riding and resiliant as any other pneumatic tire—the air space and pressure being the same.

They are the most economical and "care free" tires made and are used where tires must be depended on and tire troubles cannot be tolerated.

Made for the Automobiles of the U. S. government and European War service.

Our output is limited to a certain amount, but for a short time we offer the following reduced special prices as an Introductory Offer:

**PRICES**

	Tires	Tubes	Tires	Tubes
30x3 1/2 in.	\$8.60	\$2.30	38x4 in.	\$17.45
30x3 1/2 in.	10.65	3.10	38x4 1/2 in.	21.20
28x3 1/2 in.	12.75	3.20	36x4 1/2 in.	22.50
33x4 in.	15.75	4.20	37x4 1/2 in.	23.60
34x4 in.	16.75	4.35	38x5 in.	26.30

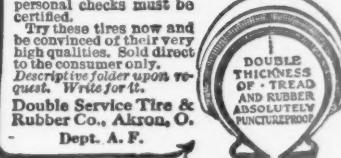
All other sizes not included in above list may be furnished. No extra charge for 10% additional tires. Payment with order entitles to special prices, a 10% discount allowed on orders for two or more tires. All personal checks must be certified.

Try these tires now and very soon you will be convinced of their very high qualities. Sold direct to the consumer only.

Descriptive folder upon request. Write for it.

Double Service Tire &amp; Rubber Co., Akron, O.

Dept. A. F.



WE MAKE THE  
**ENGRAVINGS**  
FOR THE  
AMERICAN FORESTRY  
MAGAZINE

OUR SPECIALTY  
IS THE "BETTER GRADE FINISH OF  
DESIGNS & ENGRAVINGS  
IN ONE OR MORE COLORS  
FOR MAGAZINES CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES  
DULLO-TONES  
COLOR PROCESS

LINE PLATES  
COMBINATION LINE  
AND HALF TONES  
MULTI-COLORS

ESTABLISHED 1889—  
**GATCHEL & MANNING**  
SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL  
PHILADELPHIA

**Important** When notifying *AMERICAN FORESTRY* of a change in address, please give both the old and the new address, and we should receive such notification not later than the 25th of month preceding issue

## THE FINISH IS WHAT COUNTS

*—Endurance is as important in a typewriter as in an athlete*

Many a runner starts out looking fit, but, after a lap or two, falls behind and is "all in" at the finish of the race.

So it is with typewriters. Some of them do good work at the start, but under the strain of continued use lose the close adjustments necessary to produce neat, clean-cut typewriting. They fail before they reach the home stretch.

The L. C. Smith &amp; Bros. typewriter will run the ordinary course, come in as strong at the finish—and be ready for another race. One of the reasons for this is the ball bearings found in all much used parts. Constant use can only make them run smoother and "sweeter."

The L. C. Smith &amp; Bros. typewriter is as good at the finish as at start.

Send today for catalog of Silent (8-7-6-3) or Standard (6-5-4-3) Models

L. C. SMITH & BROS. TYPEWRITER CO., Factory and Home Office: SYRACUSE, N. Y.  
Branches in All Principal Cities

# BUILD OF YELLOW PINE

*Because It's*

Economical	Sound Deadener
Workable	Resilient
Beautiful	Most Easily Obtainable
Durable	Plentiful
Non-Conductor of Temper	

*For Information*

About BRANDED STRUCTURAL, rot resisting, special Long Leaf, Factory and Building TIMBERS AND JOISTS,

About SOFT SHORT LEAF FINISH and other building and finishing sizes,

*Write*

**MISSOURI LUMBER AND LAND  
EXCHANGE COMPANY**

1111 Long Building

Kansas City, Mo.

OUR OWN MILLS PRODUCE 275,000,000 FEET ANNUALLY



# A DECLARATION OF PURPOSE

**I**n order that there may be no confusion of ideas as to the attitude of the lumbermen towards the use of building materials, the National Lumber Manufacturers Association last year went on record through the following statement unanimously adopted by its Board of Governors:

"The National Lumber Manufacturers Association has no desire to insist upon the use of wood for such purposes and in such places as it is not the best available material or cannot with proper selection and treatment be made equal to competing materials for the service required. "The National Lumber Manufacturers Association does most firmly believe, however, that official building regulations, as covering the factor of fire hazard, and as applied to details of construction for any purpose referring to the fire hazard, should be strictly in accordance with the accumulated experience of scientific underwriting, and should properly permit a free choice by the investor among all kinds of available materials, and that the best interests of municipal development and expansion, and especially of the modest home builder, require that the individual may build according to his own judgment as determined by his purchasing power, or by any special conditions, and that such freedom of preference and judgment should be construed as legal in cities, suburbs, or country. Only by such liberty of choice may the citizen, by his wise and thoughtful selection, contribute to the welfare of his fellows within his possibilities, and it is the desire of this Association to aid him to most intelligently and economically do so."

**No lumberman** desires to have his product used where it is not the best material for the purpose or where with proper selection and treatment it cannot be made equal to competing materials. BUT all lumbermen desire that wood shall be used wherever it is the material that will give satisfaction and service, and through their organizations they are prepared to give advice and assistance to all classes of consumers.

IF YOU want to know anything about lumber—kinds, qualities, uses, sources of supply, or how to build

*Ask Us*

**The National Lumber Manufacturers Association  
CHICAGO, ILL.**

Subscribing Associations are: California Redwood, Georgia-Florida Sawmill, Hardwood Manufacturers of the United States, Michigan Hardwood Manufacturers, North Carolina Pine, Northern Hemlock and Hardwood Manufacturers, Northern Pine Manufacturers, Pacific Coast Sugar and White Pine Manufacturers, Southern Cypress Manufacturers, Southern Pine, West Coast Lumbermen, Western Pine Manufacturers.

#### *Learn More About These*

The trade Extension Department of the National Lumber Manufacturers Association offers a unique free service of Architects, Engineers, Retailers and Builders. The Blue Book of the National Lumber Manufacturers Association gives prompt and reliable credit rating and collection service. The Inter-Insurance Exchange of the National Lumber Manufacturers Association furnishes sound indemnity for losses by fire in sawmills, planing mills and lumber yards.



# Hamilton Watch

THE phenomenal timekeeping records of the Hamilton Watch on American railroads have earned for it the name, "The Watch of Railroad Accuracy." You can buy a Hamilton movement alone for \$12.25 (\$13.00 in Canada) and upward, and your jeweler can fit it to your present watch case.

*Write for the Hamilton Watch Book—  
"The Timekeeper"*

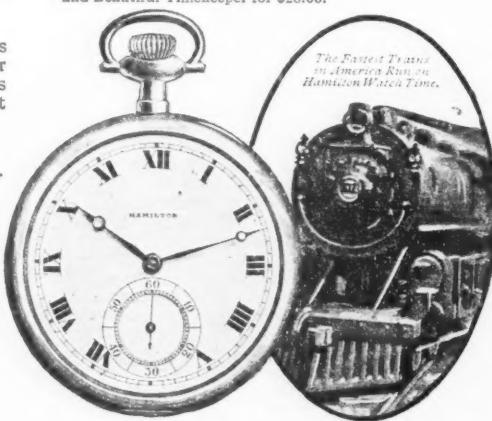
pictures and describes all Hamilton models for men and women, and tells facts worth knowing about watches.

**Hamilton Watch Co.**  
Dept. 39 Lancaster, Pa.



Conductor E. W. Dee  
of the Rock Island Railroad. He carries a Hamilton.

The watch shown here is the new Hamilton, 17-jewel, 12-size, thin model, an extremely Accurate, Durable and Beautiful Timekeeper for \$28.00.



## Expert Service

*Is Demanded  
by Modern  
Business  
Methods*

**S. B. Detwiler**  
FOREST ENGINEER  
Commercial Trust Bldg.  
PHILADELPHIA, PA.

## Forest Engineering

is expert service in the application of scientific and economic engineering knowledge and experience to forests and their products. It is essential to modern timberland ownership and operation, and equally important to the distributor and consumer of wood.

### The Field Covers

*Technical Advice and  
Practical Service*

in acquiring, estimating and mapping timber; in making valuations; in management; in selling either the stumpage or manufactured product; in selecting grades or kinds to meet your service requirements; and in preservative treatment to prevent decay.

HIGHEST QUALITY  
LOWEST PRICES  
QUICK SERVICE

Submit your Engraving  
propositions to us for  
suggestions and prices  
if you want to **SAVE  
TIME AND MONEY**

**NATIONAL ENG. CO. INC.**  
DESIGNERS-ENGRAVERS

506 14th STREET N.W.  
WASHINGTON D.C.

WRITE  
CALL  
TELEPHONE  
MAIN 8274

HILL'S  
Seedlings and Transplants  
Also Tree Seeds  
FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write today and mention this magazine.

**THE D. HILL NURSERY CO.**  
Evergreen Specialists  
Largest Growers in America  
BOX 501 DUNDEE, ILL.

## PARK and ESTATE FORESTRY

Logging Reports Utilization Studies  
Timber Estimates Forest Planting  
Etc.

*Methods and Cost of Mosquito  
Eradication*

**P. L. BUTTRICK**  
Forester and Mosquito Expert  
P. O. Box 607 New Haven, Conn.



## Yosemite Valley and the Big Trees

In the Sierras of California, a mile above the sea, is Yosemite Valley and the largest and oldest trees in the world.

This most beautiful of mountain valleys is rimmed by sheer cliffs, thousands of feet high, over which tumble snow-fed streams in cascades of marvelous beauty.

The interesting side ride from Yosemite to the big trees is made by auto.

The way to Yosemite is via Santa Fe to Merced — thence the Yosemite Valley R.R. to El Portal — the gateway.

May I send you one of our picture folders of this wonderful region?

W. J. Black, Passenger Traffic Manager  
A. T. & S. F. Ry.  
1105 Railway Exchange, Chicago, Ill.

## BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.\* :: :: :: ::

FOREST VALUATION—Filibert Roth.....	\$1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	1.60
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkgaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vol. I and II, 4 Parts to a Volume—per Part.....	5.00
FAGOTS OF CEDAR (Poems and ballads)—By Ivan Swift.....	1.00
THE WOODS—Douglas Malloch.....	1.15
RESAWED FABLES—Douglas Malloch.....	1.15
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.12
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Farnow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.70
AMERICAN FOREST TREES—Henry H. Gibson.....	6.00
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Farnow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
SEASIDE PLANTING OF TREES AND SHRUBS—Alfred Gaut.....	1.75
FAMILIAR TREES—G. S. Bouger.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
NORTH AMERICAN FORESTS AND FORESTRY—E. R. Bruncken.....	2.00
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
THE LONGLEAF PINE IN VIRGIN FOREST—G. Frederick Schwarz.....	.75
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
FOREST PHYSIOGRAPHY—By Isaiah Bowman.....	5.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Brereton (third edition).....	1.50

\* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—Editor.



Thrilling in their power and purity of tone, and true to every vibration of the strings, Ysaye's Columbia recordings are dramatically *natural* presentations of the art of the fiery Belgian genius. And Ysaye's records are representative of all

## COLUMBIA DOUBLE-DISC RECORDS

Whatever class of music you prefer: vocal, instrumental; solo, ensemble; concert, operatic, dance, orchestral, you get splendid, rich, *natural* reproductions on Columbia Double-Disc Records. They will play—perfectly—on your machine. You can get them—*everywhere*—at Columbia dealers'. Listen to them *today*. "Hearing is Believing."

*New Columbia Records on sale the 20th of every month.*

*In the National Forest Region***Colorado  
School of Forestry**A DEPARTMENT OF  
COLORADO COLLEGE

THE course in theoretical and applied forestry leading to the degree of Forest Engineer covers a period of two years and is open to students who have completed two years of college work, including a sufficient amount of Botany, Geology and Surveying.

Graduate students may enter as candidates for the degree of Master of Forestry.

Fall and Spring Terms in the Manitou Forest, the College Reserve, 6,000 acres of pine and spruce timberland on the borders of the Pike National Forest. Winter Term at Colorado Springs.

For particulars address  
**Colorado School of Forestry**  
Colorado Springs, Colo.

**Georgia State  
Forest School**  
UNIVERSITY  
OF GEORGIA

COMPLETE four-year undergraduate course in theoretical and applied forestry leading to the degree:

**Bachelor of Science in Forestry**

Wide range of specialization offered—

Logging Engineering  
Commercial Administration  
Forest Management  
City Forestry  
Dendropathology  
State Forestry  
Research

Provision for four months' field work—two following each of Freshman and Sophomore years—on McHatton Forest, a large forest estate in the Blue Ridge Mountains. Numerous excursions in Dendrology and Logging. Provision for practical work in specialization during Junior-Senior vacation.

For announcement address

FOREST SCHOOL  
**Georgia State College of  
Agriculture**  
ATHENS, GEORGIA

**The  
New York State  
College of  
Forestry**

at  
**Syracuse University**  
Syracuse, N. Y.

Under-graduate courses leading to degree of Bachelor of Science. Special opportunities for post-graduate work leading to degrees of Master of Forestry and Doctor of Economics. One-year Ranger Course on the College Forest of 1,800 acres at Wanakena in the Adirondacks. State Forest Camp, which is a month of directed recreation, open to any man over sixteen, held each August on Cranberry Lake. The State Forest Experiment Station of 90 acres and an excellent Forest Library offer unusual opportunities for research work.

For particulars address

THE NEW YORK STATE COLLEGE  
OF FORESTRY  
Syracuse, N. Y.

**DEPARTMENT OF FORESTRY****The  
Pennsylvania State  
College**

A PROFESSIONAL course in Forestry, covering four years of college work, leading to the degree of Bachelor of Science in Forestry.

Thorough and practical training for Government, State, Municipal and private forestry.

Four months are spent in camp in the woods in forest work.

Graduates who wish to specialize along particular lines are admitted to the "graduate forest schools" as candidates for the degree of Master of Forestry on the successful completion of one year's work.

For further information address

Department of Forestry  
**Pennsylvania State College**  
State College, Pa.

**Yale University  
Forest School**

NEW HAVEN, CONN., U. S. A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing and, under exceptional conditions, to men who have had three years of collegiate training, including certain prescribed subjects. Men who are not candidates for the degree may enter the School as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology, and Lumbering. The regular two-year course begins the first week in July at the School camp near Milford, Pennsylvania.

For further information  
address

JAMES W. TOUMEY, Director  
NEW HAVEN CONNECTICUT

**HARVARD  
UNIVERSITY**

DEPT. OF FORESTRY  
BUSSEY INSTITUTION

OFFERS specialized graduate training leading to the degree of Master of Forestry in the following fields:—Silviculture and Management, Wood Technology, Forest Entomology, Dendrology, and (in cooperation with the Graduate School of Business Administration) the Lumber Business

For further particulars  
address

**RICHARD T. FISHER**  
Jamaica Plain, Massachusetts



TOWER FALLS, YELLOWSTONE NATL. PARK

VISIT  
**Yellowstone  
 National  
 Park**

Largest, most phenomenal and oldest of our National Parks.

Geysers, cataracts, rivers, lakes and superb mountain scenery. Excellent hotel accommodations.

GO  
**Northern Pacific**  
 through  
**Gardiner Gateway**

*The Original, Scenic and  
 Only Northern Entrance*

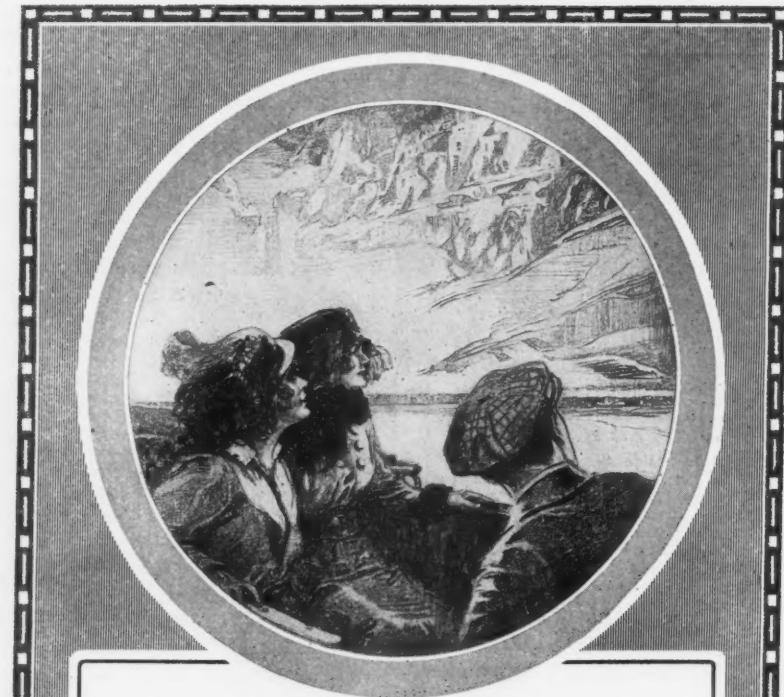
Travel the scenic highway of the Northern Pacific Railway crossing three ranges of mountains to Spokane, Rainier National Park and North Pacific Coast points. Wonderful mountain scenery.

Send for free literature and information and let us assist you in planning your 1916 vacation.

**A. M. CLELAND**, General Pass. Agent  
 372 Northern Pacific Railway  
 ST. PAUL, MINN.



**SEE AMERICA**



**Visit "Oldest America"**

The wonderland of the vivid and the picturesque, along the Apache Trail of Arizona. Here are the curious ruined homes of the ancient cliff dwellers—the great copper camps—the famous Roosevelt Dam.

See this enchanting country in a delightful motor side-trip, a part of your journey to or from the West via

**SOUTHERN PACIFIC—SUNSET ROUTE**  
 New Orleans   Los Angeles   San Diego   San Francisco

The Sunset Limited and other splendid trains afford luxurious daily service at **No Extra Fare**. Water or rail route between New York and New Orleans. Write for booklets.

**GENERAL OFFICES**  
 New York City   San Francisco   New Orleans   Houston  
 366 Broadway   Flood Building   Metropolitan Bank Building   Southern Pacific Building

FO   RE   ST   RY  
 1   2   3   4

The  
**FOREST**  
 is three-fourths of  
**FORESTRY**

Your opportunities are as unlimited as our forests if you study at

**WYMAN'S SCHOOL OF THE WOODS**  
 Incorporated   Munising, Michigan

**Orchids** We are specialists in Orchids, we collect, import, grow, sell and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

**LAGER & HURRELL**  
 Orchid Growers and Importers   SUMMIT, N. J.

**Use Press Clippings**

I will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

**The Manhattan Press Clipping Bureau**  
 ARTHUR CASSOT, Proprietor   Established 1888  
 6 East 41st Street, NEW YORK  
 Send for Our Desk Calendar

**TIMBER ESTIMATES**  
**FIRE PROTECTION PLANS**  
**MAPS, LOGGING REPORTS**  
**EMPIRE STATE FORESTERS**  
 156 Fifth Ave. New York City

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

JOSHUA L. BAILY, Pennsylvania  
ANDREW CARNEGIE, New York  
WILLIAM E. COLBY, California  
Secretary The Sierra Club  
DR. CHARLES W. ELIOT, Massachusetts  
President Emeritus Harvard University  
DR. B. E. FERNOW, Canada  
Dean of Forestry, University of Toronto  
HENRY S. GRAVES, District of Columbia  
Chief of the Forest Service  
EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON  
Secretary of Agriculture  
HON. FRANKLIN K. LANE  
Secretary of the Interior  
HON. ASBURY F. LEVER, South Carolina  
United States Representative  
HON. THOMAS NELSON PAGE  
Ambassador to Italy  
GIFFORD PINCHOT, Pennsylvania  
FILIBERT ROTH, Michigan  
Dean of Forestry, University of Michigan  
DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois  
Chairman, Conservation Department  
General Federation of Women's Clubs  
HON. WM. H. TAFT, Connecticut  
Ex-President United States  
JOSEPH N. TEAL, Oregon  
Chairman Oregon Conservation Commission  
THEODORE N. VAIL  
President A. T. & T. Co., New York  
HON. JOHN WEEKS, Massachusetts  
United States Senator  
DR. ROBERT S. WOODWARD, Washington, D. C.  
President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon  
Forester, Western For. and Conservation Assn.  
JOHN S. AMES, Massachusetts  
HON. ROBERT P. BASS, New Hampshire  
Ex-Governor of New Hampshire  
WM. B. GREELEY, District of Columbia  
Assistant U. S. Forester  
W. R. BROWN, New Hampshire  
Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut  
Professor of Forestry, Yale Forest School  
DR. HENRY S. DRINKER, Pennsylvania  
President, Lehigh University  
ALFRED GASKILL  
State Forester, New Jersey  
JOHN E. JENKS, District of Columbia  
Editor, Army and Navy Register  
CHESTER W. LYMAN, New York  
International Paper Company

CHARLES LATHROP PACK, New Jersey  
Pres. Fifth National Conservation Congress  
CHARLES F. QUINCY, New York  
J. E. RHODES, Illinois  
Secretary, Southern Pine Association  
ERNEST A. STERLING, Illinois  
Forest and Timber Engineer  
J. B. WHITE, Missouri  
Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARIES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively**; adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# Its Star Points



Colgate's Perfected Shaving Cream has several points of superiority besides the generally recognized Colgate qualities—a quick, abundant lather that needs no messy "rubbing in" with the fingers.

It gives satisfactory results with hot or cold water—

it remains creamy in warm weather instead of drying out and becoming hard—

—a delightful shampoo. After moistening the hair put a little Colgate's Perfected Shaving Cream on the wet hands and make up the fine white lather. It cleanses scalp and hair.

in cold weather also it maintains the proper consistency instead of becoming watery—

it is economical. The very last bit can be squeezed from the tube to give you a comfortable shave,

For those who prefer another form of shaving preparation Colgate's Shaving Stick and Rapid-Shave Powder give the same perfect lather.

Sold everywhere—or a trial size of Stick, Powder or Cream sent for 4c in stamps.

**Colgate & Co., Dept. 59, 199 Fulton St., New York City**

Canadian Address: Drummond Building, Montreal  
Makers of Cashmere Bouquet Soap—luxurious, lasting, refined

110 years ago was founded the House of Colgate & Co.—today the world's largest makers of fine soaps and perfumes.



